The Emu

A Quarterly Magazine to popularize the Study and Protection of Native Birds and to record Results of Scientific Research in Ornithology.

VOL. XXVIII.—1928-29.

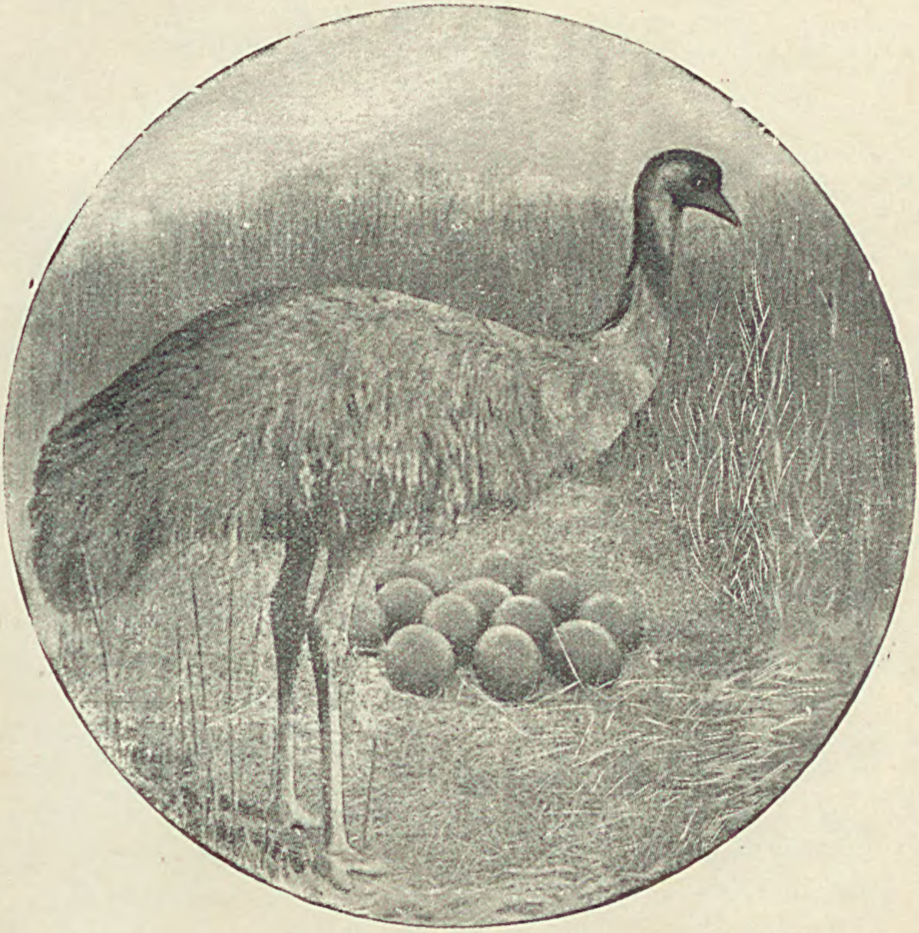

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TABLE OF CONTENTS

of

Vol. XXVIII. 1928-29.

	Page
A Critical Description of Recently Discovered Bones of the Extinct Kangaroo Island Emu..	1
Æstrelata, The Validity of the Generic Name	128
A Rare Egg Described ..	299
A Visit to Mutton Bird Rookery, Cape Woolamai	43
A Visit to Taranga, Hen and Chickens Group, N.Z.	100
Annual Reports of Hon. General Sec. and State Secretaries	274
Australian Magpies of the genus *Gymnorhina* . ..	165
Australia's Wonder Bird, The Lyrebird	199
Avifauna of the Macleay River	111
Avifauna of W.A., Relationship of	48
Balance-sheet	272
Bird Clubs	73
Bird Migration in New Zealand 138, 215,	301
Bird Notes and Birds' Notes	62
Bird Notes from Walpole Island	136
Bird Notes from Yarraberb	121
Bird Protection in Australia	263
Birds of Canberra, Federal Territory	252
Birds of Central Northern Victoria	83
Birds of Mt. Tambourine..	131
Birds of Port Stephens ..	243
Bogong High Plains, Notes of Trip to	66
Brown Bell-magpie	241
Bustard, Love Display of..	198
Camera Craft, 75, 151, 227, 229, 251, 289, 313.	
Cole's Lorikeet	81
Collecting and Non-Collecting	255
Condition of Mutton-bird Rookeries, Phillip Island	45
Congress	160
Congress and Camp-out ..	236
Correspondence 159,	235
Cradle Valley, Glimpses of Bird Life in	295
Crows in Western Australia, Movements of ..	71
Cuckoos, Honeyeaters and	177
Economic Value of Birds..	287
Fauna and Flora Reserves in W.A.	69
From Magazines	234
Glimpses of Bird Life in Cradle Valley, Tas.. ..	295
Greetings from A.O.U. ..	320
Honeyeaters and Cuckoos	177
Irwin Valley, W.A., Ornithological Notes on ..	192
Kangaroo Island Emu, Critical Description of ..	1
Love Display of the Australian Bustard	198

Contents of Vol. XXVIII.—1928-29

Page
Lyre-bird, The—Australia's Wonder Bird .. 199
Macleay River, N.S.W., Avifauna of the .. 111
Meetings of Council .. 78, 159
Movements of Crows in Western Australia .. 71
Nesting Notes From a Sydney Garden .. 183
New Caledonia, Notes of a Trip to .. 20
News and Notes .. 77, 158, 235
Notes of Trip to New Caledonia .. 20
Notes of Trip to Bogong High Plains .. 66
Obituaries .. 156
Observations of "Jacky Winter" .. 150
Ornithological Notes on the Irwin Valley, W.A. .. 192
Perth Committee, Report of 285
Presidential Address—Collecting and Non-Collecting .. 255

Page
Red-capped Dotterel .. 226
Relationship of the Avifauna of W.A. .. 48
Reports, Annual .. 274
Report of Perth Committee, 1927 .. 285
Reviews .. 317
So-called Bird Pests .. 129
Status of Certain Species of the Genus *Ninox* .. 161
Stray Feathers 19, 47, 61, 65, 76-7, 82, 99, 110, 130, 153-5, 182, 191, 197, 214, 230-232, 242, 294, 298, 315-7.
Swift Parrot in Tasmania, The .. 292
Validity of the Generic Name *Æstrelata* .. 128
Vicissitudes of a Noddy .. 290
Unknown Eggs of Australian Birds .. 299
Yellow-throated Scrub-wren .. 134

Contents of Vol. XXVIII.—1928-29

AUTHORS OF PAPERS.—VOL. XXVIII.

Page
Ashby, Edwin 241
Bligh, A. C. V. 129
Bryant, C. 62
Campbell, A. G. 165
Cayley, N. W., Chisholm, A. H., and 243
Cayley, N. W. 161
Chisholm, A. H., and Cayley, N. W. 243
Coles, Clifford 81
De Warren, J. J. 111
Dickison, D. 43
D'Ombrain, Dr. E. A. .. 255
Dove, H. Stuart 295
Elliott, A. J. & A.O. 134
Hall, Robt.. 48
Hanks, Mrs. Pearl 150
Iredale, Tom 290
Jones, D. P. 252
Kinghorn, J. R. 263

Page
Leach, Dr. J. A. 20, 199
Leach, H. A. C... .. .. 83, 177
Le Souef, Lance 287
Legge, R. W. 226
Mathews, G. M. 299
Mattingley, A. H. E. 198
Moncrieff, Mrs. Perine, 100, 138, 215, 301
Miller, Blanche E. 131
Morgan, A. M. and Sutton, J. 1
Oliver, W. R. B. 128
Paterson, A. 66
Serventy, D. L. 192
Sullivan, C. S. 136
Sutton, J., Morgan, A.M., and 1
Wilson, A. H. R. 121
Wolstenholme, H. 183

Contents of Vol. XXVIII.—1928-29

ILLUSTRATIONS—VOL. XXVIII.

Princess Parrot (coloured) .. .. plate 1
"View on the North Side of Kangaroo Island" .. .. plate 2
Kangaroo Island Emus (Lesueur) .. .. plate 3
Skeleton of the Kangaroo Island Emu .. .. plate 4
Kangaroo Island Emu (Vieillot) .. .. plate 5
Kangaroo Island Emu (Milne-Edwards and Oustalet) .. .. plate 6
Kangaroo Island Emu (Rothschild) .. .. plate 7
Right Femur of Emus; Left Femur of Emus .. .. plate 8
Right Tibio-tarsus of Emus; Left Tibio-tarsus of Emus.. .. plate 9
Right Tarso-metatarsus of Emus; Left Tarso-metatarsus of Emus .. .. plate 10
Right Fibula of Emus; Left Fibula of Emus .. .. plate 11
Pelves of Emus .. .. plate 12
Left Foot of Emus; Sternum of Emus .. .. plate 13
Wing Bones of Emus; Coraco-scapula of Emus .. .. plate 14
Ribs of Emus .. .. plate 15
Cranium of Emus; Lower Mandible of Emus .. .. plate 16
Plum Farm, Southern New Caledonia .. .. plate 17
The Kagu in Display .. .. plate 18
The Perched Rock, Near Bourail .. .. plate 19
Silver Gull .. .. plate 20
Nest of the Fantail-Warbler .. .. plate 21
Lorikeets—*Trichoglossus colesi, T. rubritorquis,* and *T. moluccanus* (coloured) .. .. plate 22
Male Red-capped Robin .. .. plate 23
Eastern Shrike-tit and Young; White-browed Babbler .. .. plate 24
Willie Wagtail; Blue-faced Honey-eater .. .. plate 25
Australian Pipit; Rufous Song-Lark .. .. plate 26
Where White-fronted Terns nest; here Petrels burrow .. plate 27
Western Portion of Taranga; Nest of Black-backed Gull .. plate 28
The Lagoon, Yarraberb; Grass Lands, Yarraberb .. .. plate 29
Restless Flycatcher on Nest .. .. plate 30
Little Penguin on Nest, Phillip Island .. .. plate 31
Young Horsfield Bronze Cuckoo; Hooded Robin .. .. plate 32
Olive-backed Oriole; Little Wattle-bird at Nest .. .. plate 33
Boobook Owls — *Ninox yorki* and *Ninox ooldeænsis* (coloured) .. .. plate 34
Brown-headed Honeyeater; Young "Brown-heads" .. .. .. plate 35

Contents of Vol. XXVIII.—1928-29

Fuscous Honeyeater and Young Pallid Cuckoo; Young Pallid Cuckoo . . . . plate 36
Fuscous Honeyeaters; Blue-faced Honeyeaters . . . . plate 37
Grey Thrush on Nest . . . . plate 38
Grey Thrush Eating Cheese on Hand . . . . plate 39
Views of the Irwin Valley, W.A. . . . . plate 40
The Australian Bustard in Display . . . . plate 41
Nest of Superb Lyrebird . . . . plate 42
The Banded Plover . . . . plate 43
Brown Tree-creeper Leaving Nest in Bank; Removing Stone From Nest . . . . plate 44
Female Blue Wren Feeding Cuckoo; Male Blue Wren Feeding Cuckoo . . . . plate 45
Dr. E. A. D'Ombrain . . . . plate 46
Brown Bell-magpie (coloured) . . . . plate 47
Party on Schnapper Island; Entrance to Port Stephens. . . . plate 48
R.A.O.U. Party on the Myall River, N.S.W. . . . . plate 49
White-winged Petrel on Nest; at Nest With Egg . . . . . . plate 50
Female Penguin in Nest With Young . . . . plate 51
Penguin and Young Lifted From Burrow . . . . plate 52
Kookaburra on Shoulder of Mr. D'Ombrain . . . . plate 53
Kookaburra on Hand of Mr. D'Ombrain . . . . plate 54
Lyrebird Feeding Chick . . . . plate 55
Nest and Eggs of Painted Quail; Nest and Egg of White-throated Nightjar . . . . plate 56
Grey Fantail on Nest . . . . plate 57
Yellow-winged Honeyeater at Nest . . . . plate 58
Fuscous Honeyeater at Nest . . . . plate 59

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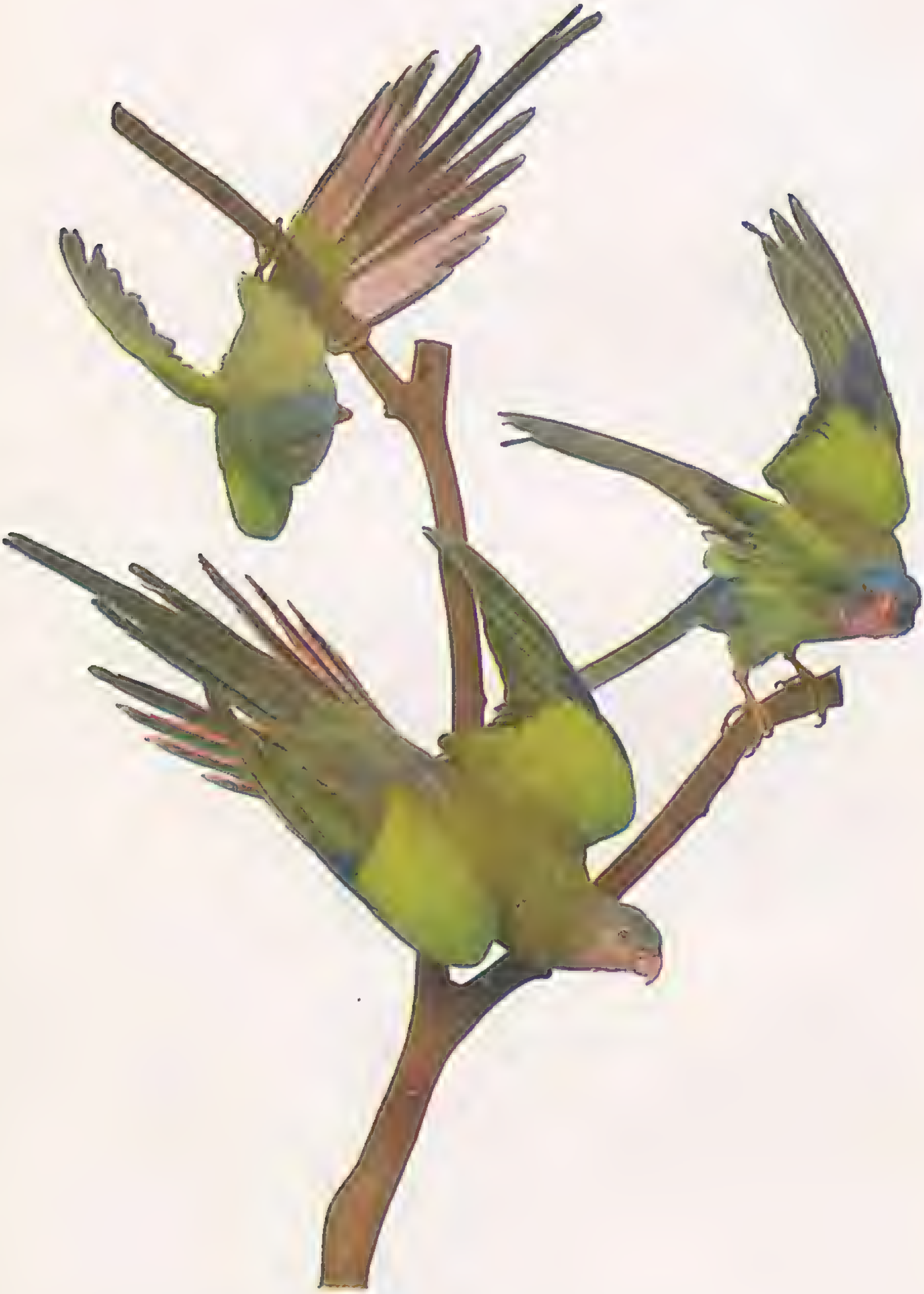

The Princess Parrot (*Polytelis alexandrae*).
For note see Camera Craft, page 75.

The Emu
OFFICIAL ORGAN OF THE
ROYAL AUSTRALASIAN ORNITHOLOGISTS' UNION

"Birds of a Feather."

VOL. XXVIII.] 1st JULY, 1928. [PART 1

A Critical Description of Some Recently Discovered Bones of the Extinct Kangaroo Island Emu (*Dromaius diemenianus*)

By A. M. MORGAN, M.B., B.S., and J. SUTTON,
Ms.R.A.O.U., Adelaide.

THE DISCOVERY OF THE EMU.

On 21st March, 1802, Captain Matthew Flinders, in the "Investigator," anchored near Kangaroo Head, at the eastern extremity of Nepean Bay, and landed on Kangaroo Island the next day. Writing under date of 23rd March, 1802, on page 170, of "A Voyage to Terra Australis," he says:—"The scientific gentlemen landed again to examine the natural productions of the island, and in the evening eleven more kanguroos were brought on board; but most of them were smaller and seemed to be a different species to those of the preceding day. Some of the party saw several large running birds, which, according to their description, seemed to have been the emu or cassowary."

Those gentlemen were thus the discoverers of the Kangaroo Island Emu. On page 184 he writes:—"Not less than thirty emus or cassowaries were seen at different times, but it so happened that they were fired at only once, and that ineffectually. They were most commonly found near the longest of the small beaches to the eastward of Kanguroo Head, at the place represented on the annexed plate (Fig. 1), where some little drainings of water oozed from the rocks." He makes no further mention of the bird.

Facing page 184 is an engraving (Fig. 1) entitled "View on the north side of Kanguroo Island," drawn by W. Westall. This view includes specimens of kangaroos, seals, and two struthious birds, one of which has a white head and neck. The figures, however, cannot be looked upon as accurate drawings of the Emu—their shape and contour resemble those of ostriches, from which Westall probably copied them.

Flinders left Kangaroo Island for the last time on 6th April, 1802, and a few days later Captain Nicholas Baudin, in "Le Geographe," visited the island. The visit was a short one, and no dates or observations are given in the narrative of the voyage (Voyage de Découvertes aux Terres Australes). Baudin, in "Le Geographe," accompanied by "Le Casuarina," arrived off the island, for the second time, on 3rd January, 1803, and anchored in Nepean Bay on 6th January. "Le Geographe" remained in the neighbourhood until 1st February. It was during this second trip that MM. Péron, Leschenault, Bailly, and Lesueur made their observations upon the natural history of the island, and obtained three living specimens of the Emu, the remains of which were the only known examples of the bird until the discoveries of the bones which are the subject of this article.

WHEN DID THE EMU BECOME EXTINCT?

We know from the description of Flinders, and Péron and Freycinet, that the bird was numerous in 1802 and 1803, and that the island was uninhabited.

R. Montgomery Martin states in his "British Colonies" that the native wife of a European sealer or runaway sailor killed "the last Emu on the island" some years before the arrival of the South Australian Company's colonists in 1836. He gives no authority for that statement; but at any rate it was certainly extinct on the arrival of the above settlers; so that the Kangaroo Island Emu was exterminated between the years 1803 and 1836—the short term of 33 years.

HOW DID IT BECOME EXTINCT?

It is known that sealers were settled on the island in 1806, or probably even before that, and that they lived upon the natural resources of the land, and the produce of some small plots which they cultivated. They naturally killed Emus for food when opportunity occurred. Is it possible that these sealers destroyed the whole Emu population? We think not. The island is 90 miles long and 35 miles broad at the greatest width. A great part of it is covered with almost impenetrable scrub, and as the sealers had no means of locomotion other than boats or their own legs, it is improbable that they visited more than a small part of the island; more especially as their headquarters were all close together on the shores of Nepean Bay. Kangaroos and wallabies were plentiful and easily procured, so that there was not much inducement for them to travel far from their homes to obtain the marsupial skins in which they traded, as well as in seal skins; so that it seems highly improbable that this small body of persons (40 is the largest number known to have been there at one time) could have traversed the 1,680 square miles of this large island, or, if they did so, would have preferred emu to the kangaroo and

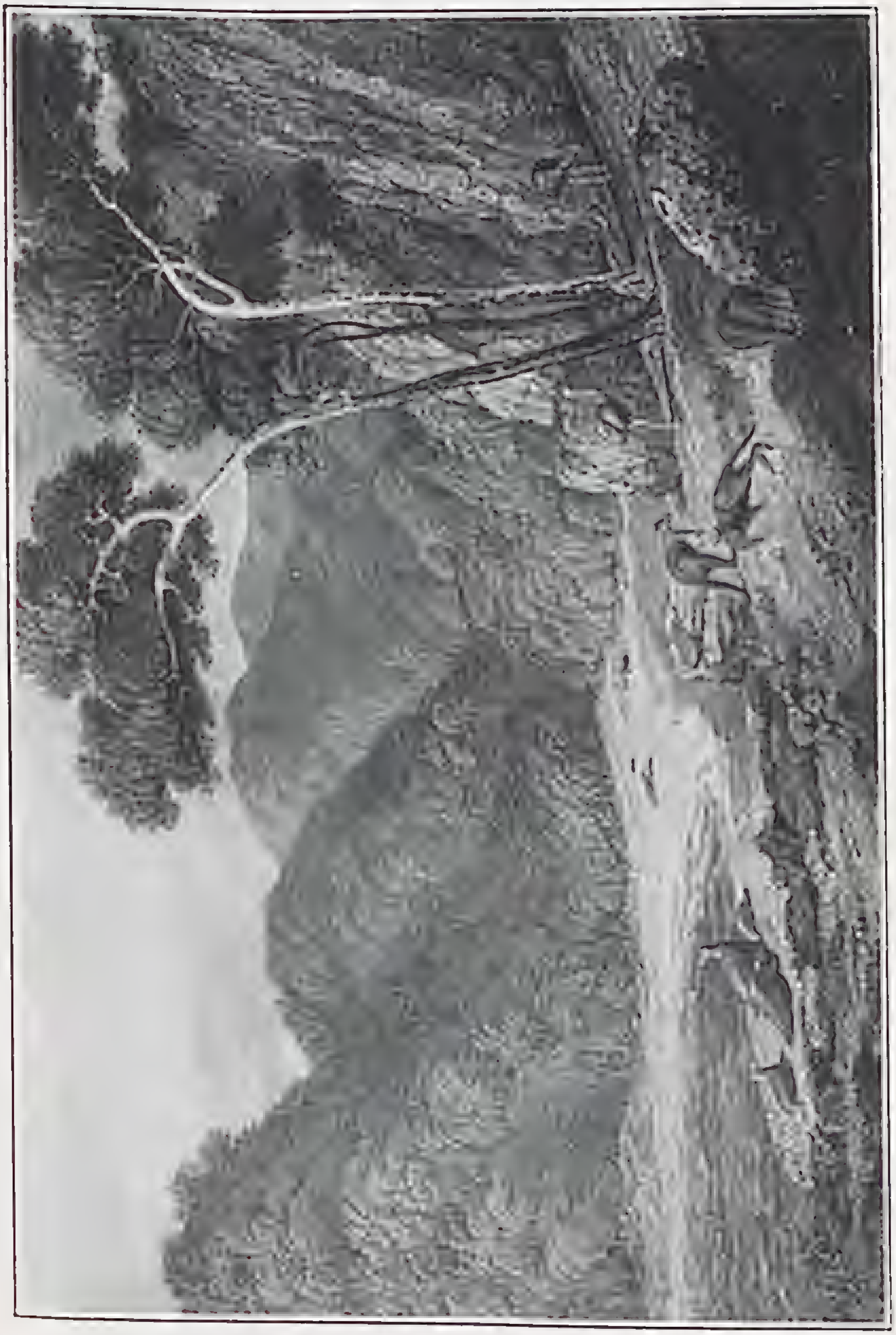

Fig. 1.—“View on the North side of Kangaroo Island,” drawn by W. Westall. (From Flinders, “A Voyage to Terra Australis.”)

wallaby meat which they had at hand. It is more likely that bush fires were the cause of its final extinction, for, though Flinders found traces of former large bush fires at the time of his visit, they must have become more common after the settlement of Europeans. The circumstances under which the latest bones were found in caves also point to this solution of the question. For the openings of the caves are for the most part large, very easily seen and avoided, and it seems extraordinary that the Emus should have fallen in in such numbers had they not been in confused flight from a danger such as a bush fire. In fact, their only dangers were the settlers and the fires kindled by them. There were never any Dingoes *(Canis dingo)* on the island, and the largest carnivorous animal was the Tiger Cat *(Dasyurus maculatus)*, now extinct in the locality.

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1. Flinders—"A Voyage to Terra Australis," 1814.
2. Péron and Freycinet—"Voyage de Découvertes aux Terres Australes," Vol. II., 1816.
3. Vieillot—"Galerie des Oiseaux," 1825.
4. Milne-Edwards and Oustalet—"Notice sur quelques espéces d'Oiseaux, actuellement étéintes qui se trouvent representées dans les collections du Museum d'Histoire Nationelle, Paris," 1893.
5. Salvadori—"Catalogue of the Birds in the British Museum," Vol. 27, p. 585, 1895.
6. Giglioli—A third specimen of the extinct *Dromaius ater* (Vieillot), found in the R. Zoological Museum, Florence, "Nature," Vol. 62, p. 102, 1900.
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9. Giglioli—On the Extinct Emeu of the small islands off the S. coast of Australia and probably Tasmania. "Nature," Vol. 75, p. 534, 1907.
10. Rothschild—"Extinct Birds," p. 235, 1907.
11. Spencer and Kershaw—A collection of sub-fossil bird and marsupial remains from King Island, Bass Strait, "Memoirs of the National Museum, Melbourne, No. 3," Feb., 1910.
12. Mathews—"The Birds of Australia," Vol. 1, pp. 19-22, 1910.

13. Mathews—"The Birds of Australia," Vol. 1, part 1, pp. 23-26, 1910, *Dromaius minor*, the King Island Emu.

14. Brasil—The Emu of King Island, "Emu," Vol. 14, p. 88, 1914—Extracted from the "Bulletin de la Société Linneene de Normandie," 1913.

The narrative and engraving in the work of Flinders have already been referred to.

Lesueur's picture in Péron and Freycinet's work was the first authentic figure published of this Bird (Fig. 2). Mathews has reproduced this picture for his "Birds of Australia," under the name of *Dromaius minor*, the King Island Emu, to which species he considered it should be referred on account of the white neck. The conclusions of Mathews have been effectively disposed of by Brasil, to whose arguments we might add that it is exceedingly improbable that Lesueur would have taken as a model for his picture a bird that he had never seen alive when he had three living specimens before him. That the picture was a complete and exact one is shown by the amount of detail, even to the depiction of a deformed outer toe of the left foot, which deformity in itself points to the model being a bird in confinement. There are two adult birds in Lesueur's picture, a male and a female, and it is a male only which has a white neck. (If, as is supposed, the mounted specimen in the Paris Museum is a female, it may well be that the male *had* a white neck.) The two chicks in the picture are unlike those of *Dromaius novæ-hollandiæ.* It is not known from what material they were drawn, as the narrative of the expedition makes no mention of any young birds. Péron and Freycinet gave no description of the species, as they were unaware that it differed from *Dromaius novæ-hollandiæ.* The three specimens obtained by the Baudin Expedition were taken alive to Paris. According to Milne-Edwards and Oustalet, one was placed in the Menagerie attached to the Museum and two were sent to "La Malmaison," the residence of the Empress Josephine; these latter were probably sent to the Menagerie at a later date. The final disposal of the three birds was as follows:—(1) probably a female was mounted and placed in the Zoological Gallery of the Parisian Museum, and is still there. This bird died in April, 1822. (2) was prepared as a skeleton and placed in the Anatomical Gallery of the same Museum, and is still there. This bird died in May, 1822. (3) This specimen, a male (Fig. 3), was lost for many years until its re-discovery by Professor Giglioli in the Royal Zoological Museum at Florence. The skeleton is not complete. Giglioli states that various parts, *viz.*, "Pectoral arches, both wings, the patellæ (sic), two distal phalanges of the right foot and one of the left foot, in the hind limbs, and the palatines, pterygoids, the vomer, and the maxillary processes of the nasals are missing. The first pair of cervical ribs and the two lumbar ribs, the left one of the first pair and the right one of the

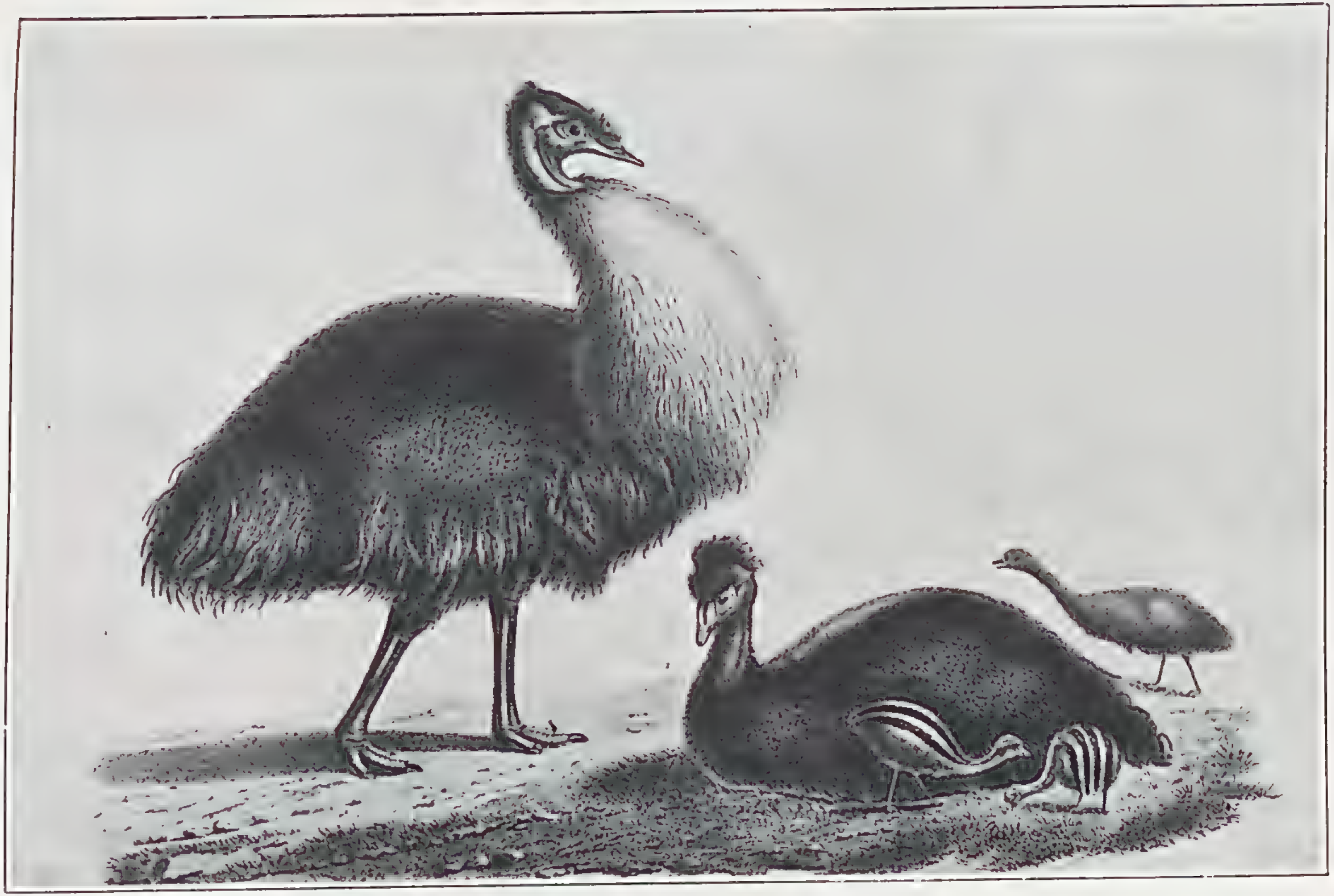


Fig. 2.—Kangaroo Island Emus, drawn by C. A. Lesueur. (From Péron and Freycinet, "Voyage de Decouvertes aux Terres Australes.")

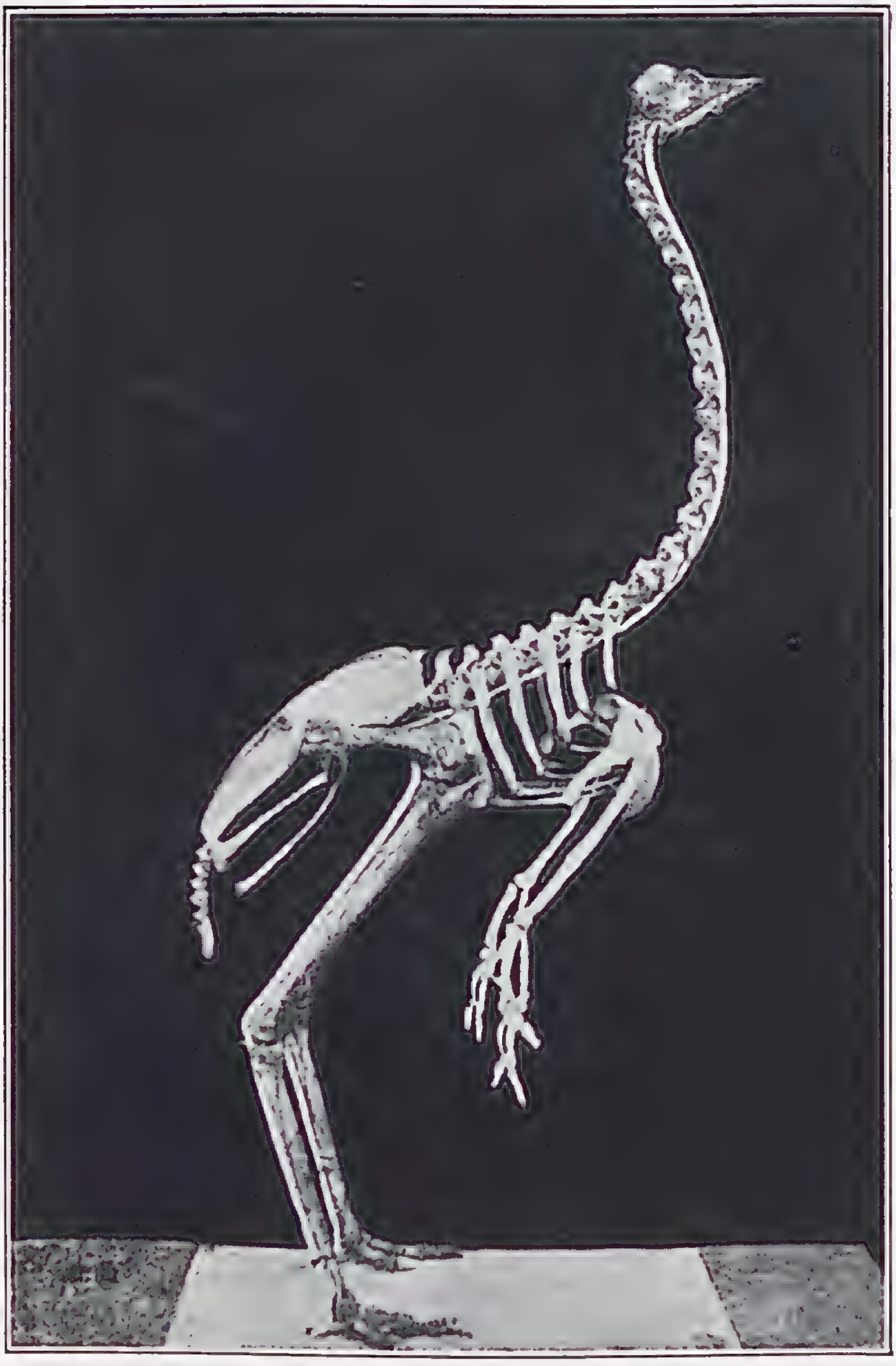


Fig. 3.—Skeleton of the Kangaroo Island Emu in the Florence Museum. (From "The Ibis," 1901, p. 7.)

second, are also missing." Giglioli further states "that these have been replaced by very faithful imitations in wood, evidently copied from those of the perfect mounted specimen in the Paris Museum. The wings, however, are quite unlike those of an Emu, and are evidently a copy in miniature of those of an Ostrich."

From the mounted skin in the Paris Museum, four pictures have been made—

1. published by Vieillot, in his "Galerie des Oiseaux," in 1825. (Fig. 4.)
2. published by Milne-Edwards and Oustalet, in 1893. (Fig. 5.)
3. published by Rothschild, in "Extinct Birds," in 1907. (Fig. 6.)
4. published by Mathews, in "The Birds of Australia," in 1910. (Fig. 7.)

Of the first of these Milne-Edwards and Oustalet say that it is "rather poor," whilst Rothschild states "it is quite excellent." A photograph of this picture gives no indication of either an ear or a wing. As in the other pictures, the feathers on the back and side are very much broader than those of *Dromaius novæ-hollandiæ*. Lesueur's picture is an exception in that the plumage agrees very well with that of the larger species.

The next figure was published by Milne-Edwards and Oustalet. This bird has no external ear, but has a white throat and a wing indicated by a group of very broad feathers.

Rothschild's figure has a conspicuous external ear, a very dark chin and neck, and a wing, as in Milne-Edwards and Oustalet's figure.

Mathews's picture, entitled *Dromæus parvulus*, is a copy of Milne-Edwards and Oustalet's, by the same artist. The one entitled *Dromæus minor* is an almost exact copy of Lesueur's. We therefore have three pictures taken from the same specimen in the Paris Museum, which differ materially from one another—two of them show a wing and one not, one shows a conspicuous external ear and two not, one has a white chin and throat and two have a black chin. In Vieillot's picture the point of the upper mandible is hooked, as it is also in that of Milne-Edwards and Oustalet to a less extent, while in Rothschild's it is straight.

A specimen in the Liverpool Museum, which has been supposed to be the Kangaroo Island Emu, was presented by Captain Mathews, of the S.S. "Great Britain," on 25th March, 1854. Mr. A. T. Saunders, of North Adelaide. has kindly ascertained for us that the "Great Britain" left Melbourne on 3rd December, 1853, and never called at Kangaroo Island or any port in South Australia, and as the Kangaroo Island Emu was long extinct in 1853, it seems impossible that it could be a skin of that bird. In the opinion of the late Dudley Le Souef, the specimen in the Liverpool Museum was that of a young *Dromaius novæ-hollandiæ.*

Milne-Edwards and Oustalet make some errors in dates and names in their account of the Kangaroo Island Emu. "Le Naturaliste" never visited Kangaroo Island, having left King Island for France on 8th December, 1802. The ship accompanying "Le Geographe" was the schooner "Le Casuarina." The ships did not arrive at the end of December, 1802, but sighted Cape Willoughby on 2nd January, 1803, coasted round the island southwards, and "Le Geographe" anchored in Nepean Bay on 6th, "Le Casuarina" arriving there on the 7th January, 1803. The latter boat left on the night of 10th or 11th January to explore Spencer and Saint Vincent's Gulfs. The "two months'" operations were actually 25 days. Admiral Baudin should be Captain Baudin. The naturalists, given as Péron, Maugé, Lesueur, and Levillain should have been Péron, Leschenault, Bailly, and Lesueur (Péron, zoologist; Leschenault, botanist; Bailly, mineralogist; and Lesueur, natural history painter). Maugé died at Maria Island, Tas., on 21st February, 1802, and Levillain died at sea on 29th December, 1801.

Their description does not agree with the figure, for they say that the front of the neck is almost entirely covered with black hair-like feathers, whereas in the figure that part is white.

Rothschild, in his description, says that Péron and Freycinet's figures of the male and female are not good, but that "those of the young and nestlings appear to me to be quite excellent." As there are no specimens existing of either the young or nestlings, we do not know on what grounds Rothschild forms that opinion; but, if it be so, the nestling must have differed greatly from the specimens of the chicks of *Dromaius novæ-hollandiæ* in the South Australian Museum, and in which the ground colour is rufous-brown, with narrow white longitudinal stripes. We have been unable to find any confirmation of Rothschild's statement that an Emu was ever on Flinders Island, Furneaux Group, Bass Strait.

The account by Mathews is a copy of that of Milne-Edwards and Oustalet, with all its errors and with the addition of two mis-spelt names.

BONES.

Professor Howchin discovered in January, 1903, at the Brecknells sandhills, near Cape Gantheaume, on the south coast of Kangaroo Island, a tibio-tarsus and a tarso-metatarsus of an immature bird. The epiphyses of these bones are want-

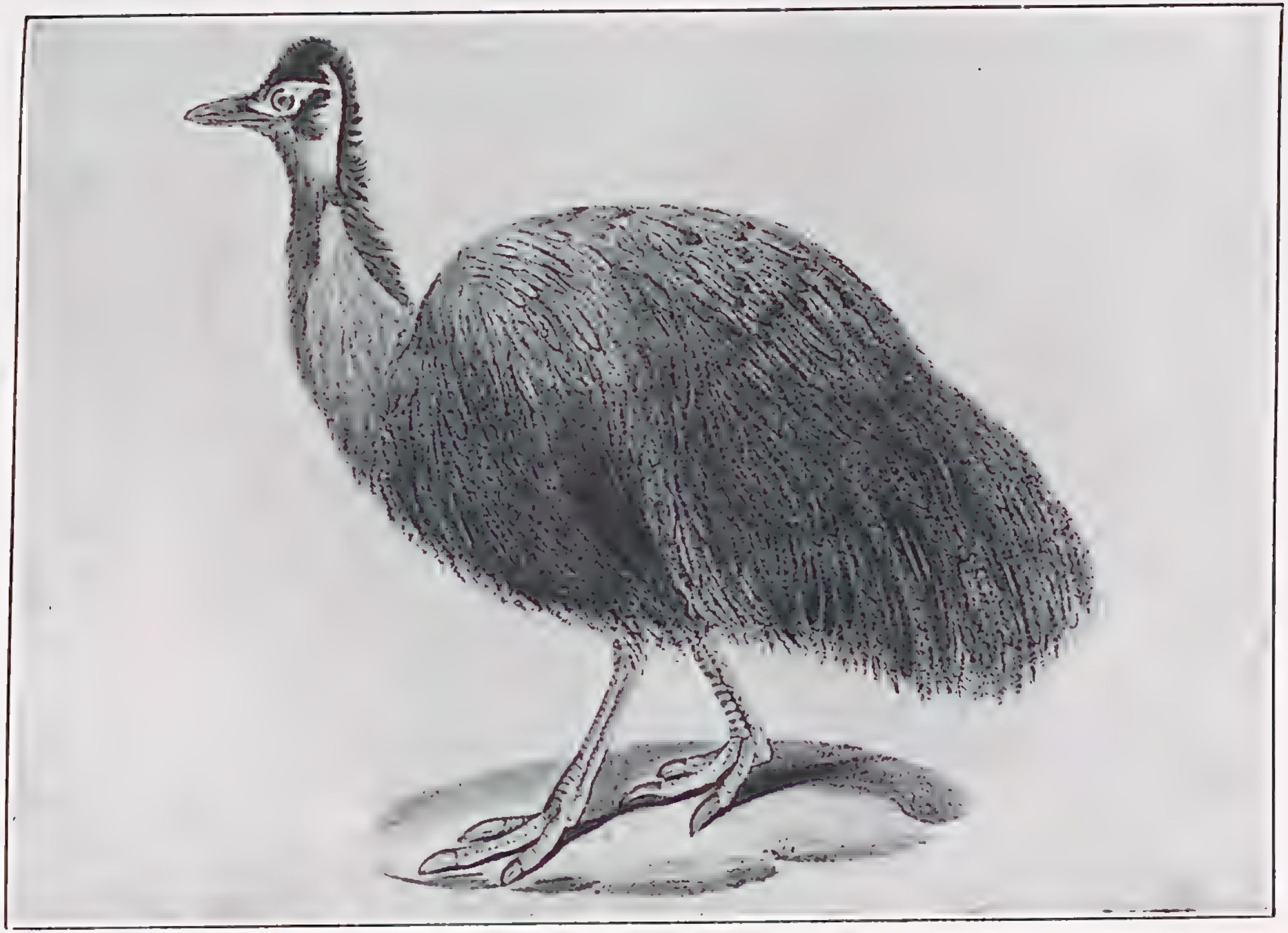


Fig. 4.—Kangaroo Island Emu. (From Vieillot, "Galerie des Oiseaux.")

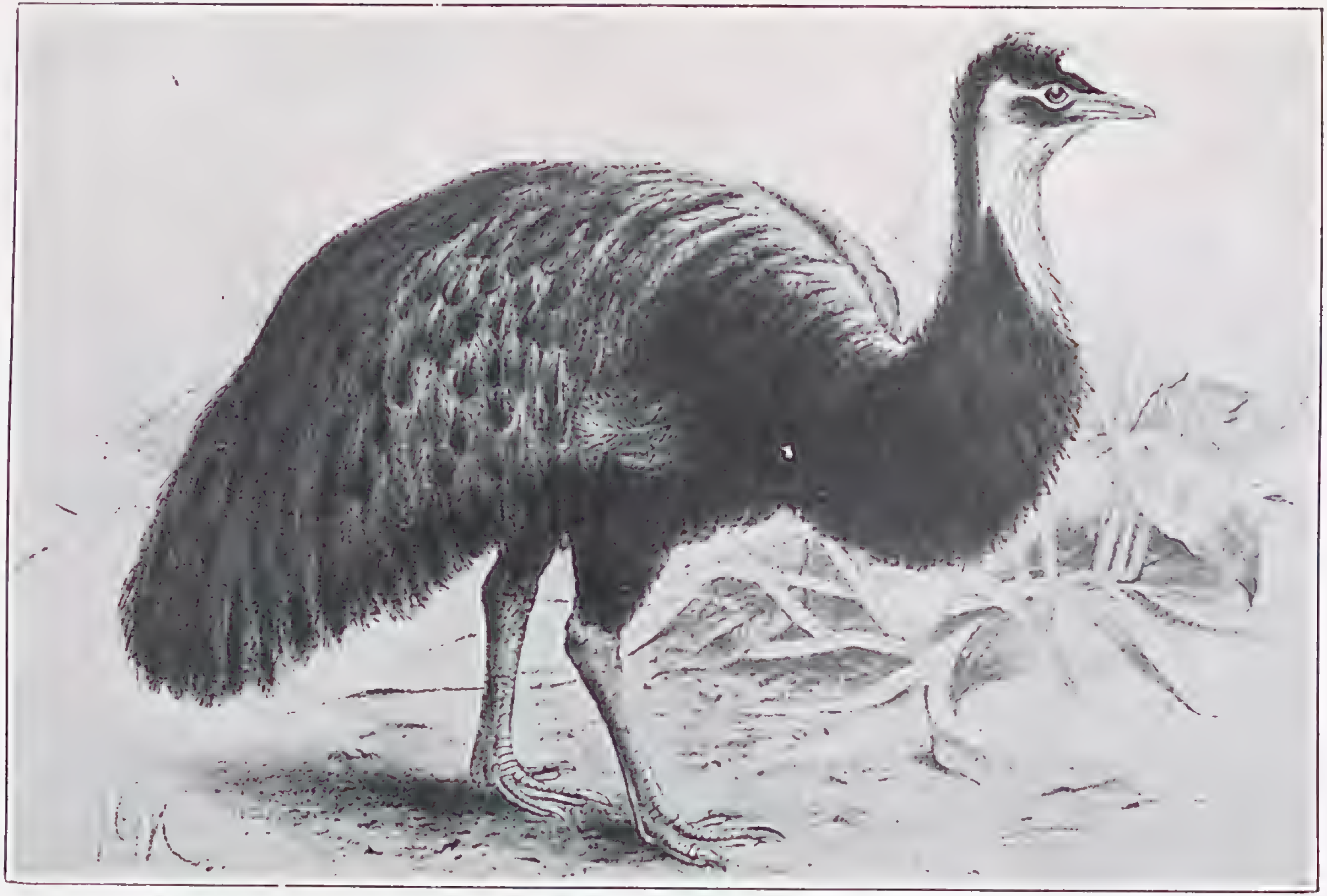
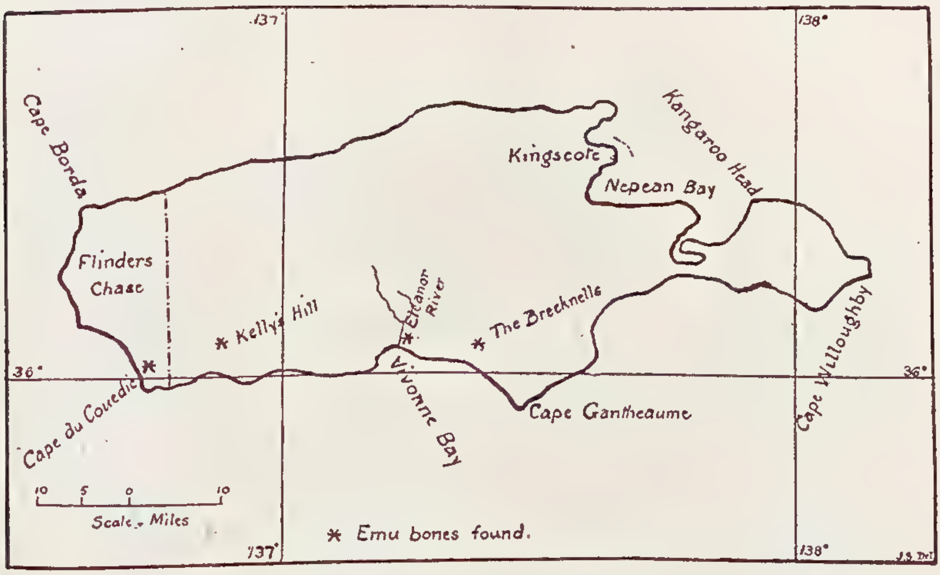


Fig. 5.—Kangaroo Island Emu, from the type specimen in the Paris Museum. (From Milne-Edwards and Oustalet, "Centenary Number of the Paris Museum.")
Fig. 7.—A copy of above Plate appeared in Mathews, "Birds of Australia," Plate 3.

ing. Spencer and Kershaw figure those two bones. The accompanying list of the bones of the Kangaroo Island Emu in the South Australian Museum shows the names of the finders and the dates of discovery. So far all the bones discovered have come from near the south coast of the island. (See Map.) Only complete, apparently adult bones have been measured and photographed; in some instances, for one or another reason, more bones have been measured than have been photographed. Those measurements in the first columns, in heavier type, are those of an individual bird (B.6814).



FEMUR (Figs. 8 and 9).

In all, 20 of these were discovered; 14 were measured, and 11 photographed. Milne-Edwards and Oustalet state that in the Kangaroo Island Emu *(Dromaius diemenianus)* the "head of the femur is more detached, intercondylar sulcus narrower and limited by more prominent condyles." This is not the case with our series of bones. The bone does not differ from that of the mainland species *(Dromaius novæ-hollandiæ)*, except in size. The longest of the right femora is 18.20 cm., the shortest 17.30 cm., average 17.76 cm.; the longest left is 18.20 cm., the shortest 17.50 cm., average 17.75 cm. In the King Island Emu *(Dromaius minor)*, 64 femora vary in length from 18.60 cm. to 13.00 cm., average 16.12 cm., so that the longest femur in the King Island Emu is greater than the longest of our series, and the shortest, shorter. However, Spencer and Kershaw state that their series contains bones of birds of different ages, and that the smaller bones may possibly have been immature. Detailed measurements in centimetres:—

	RIGHT.		LEFT.	
	Length.	Smallest diameter of shaft.	Length.	Smallest diameter of shaft.
	17.50	2.20	17.50	2.25
	17.30	2.05	17.50	2.05
	17.80	1.90	17.50	2.40
	17.80	2.30	17.70	2.20
	18.00	2.20	17.80	2.05
	18.20	2.25	17.80	2.20
	—	—	18.00	2.00
	—	—	18.20	2.20
Average	17.76	2.15	17.75	2.16
Florence	16.80	—	—	—
Paris	18.00	—	—	—
D. minor Average. ..	16.35	—	16.39	—
D. novæ-hollandiæ ..	22.35	2.50	22.05	2.30

TIBIO-TARSUS (Figs. 10 and 11).

Twenty-eight of these bones were discovered; 20 of which were measured, and 17 photographed. The longest right is 33.60 cm., and the shortest 32.10 cm., average 32.97 cm. The longest left is 34.50 cm., the shortest 32.00 cm., average 33.00.

In the King Island Emu, of 41 specimens, the measurements vary from 35.40 cm. to 26.60 cm.; the average—right 29.30 cm., left 29.16 cm. There again the longest bones are greater than any of the Kangaroo Island species, and the shortest, less, the average being less than the Kangaroo Island species.

	RIGHT.		LEFT.	
	Length.	Smallest diameter of shaft.	Length.	Smallest diameter of shaft.
	32.90	1.80	33.10	1.75
	32.10	1.50	32.00	1.40
	32.90	1.50	32.20	1.40
	32.90	1.50	32.30	1.40
	33.00	1.40	32.80	1.40
	33.10	1.30	32.90	1.45
	33.30	1.50	32.90	1.50
	33.60	1.55	33.00	1.50
	—	—	33.10	1.45
	—	—	33.60	1.45
	—	—	33.70	1.50
	—	—	34.50	1.55
Average	32.97	1.50	33.00	1.47
Florence	30.00	—	—	—
Paris	34.20	—	—	—
D. minor Average. ..	29.30	—	29.16	—
D. novæ-hollandiæ ..	41.70	2.00	41.70	2.00

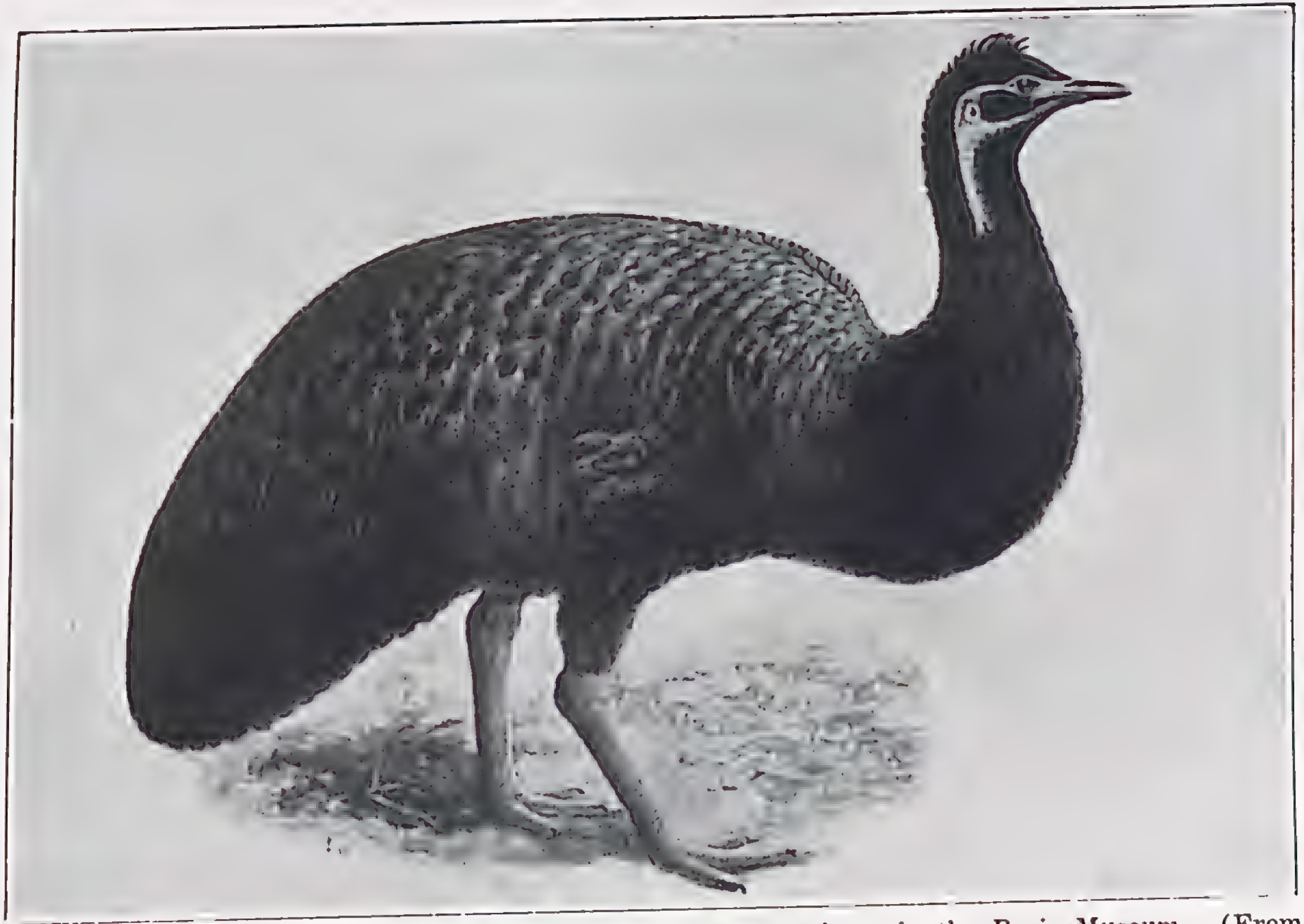


Fig. 6.—Kangaroo Island Emu, from the type specimen in the Paris Museum. (From Rothschild, "Extinct Birds.")

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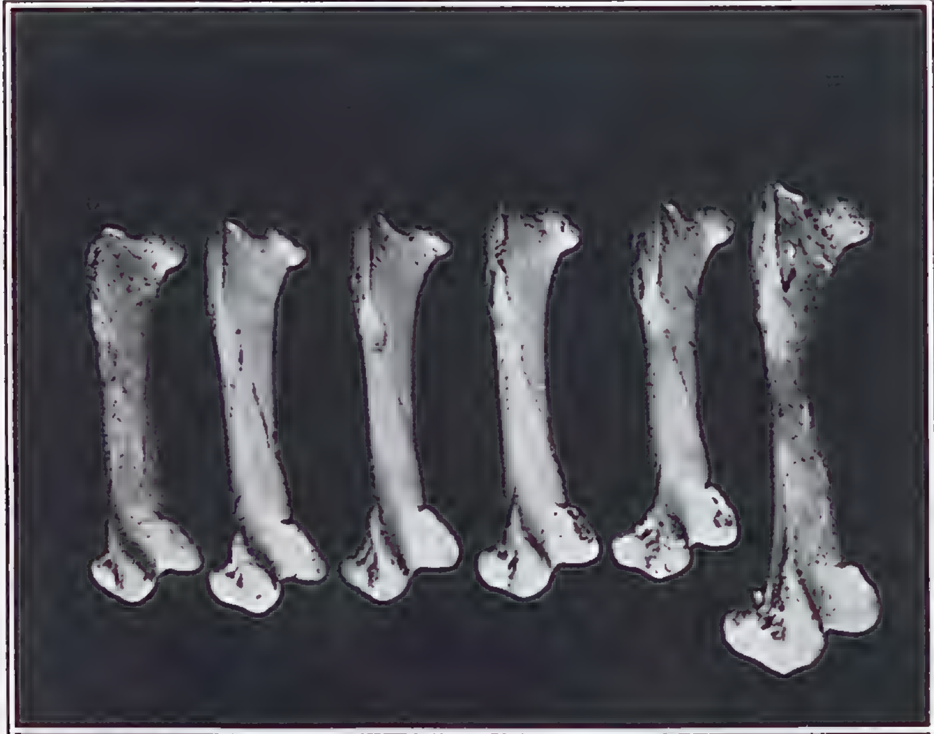


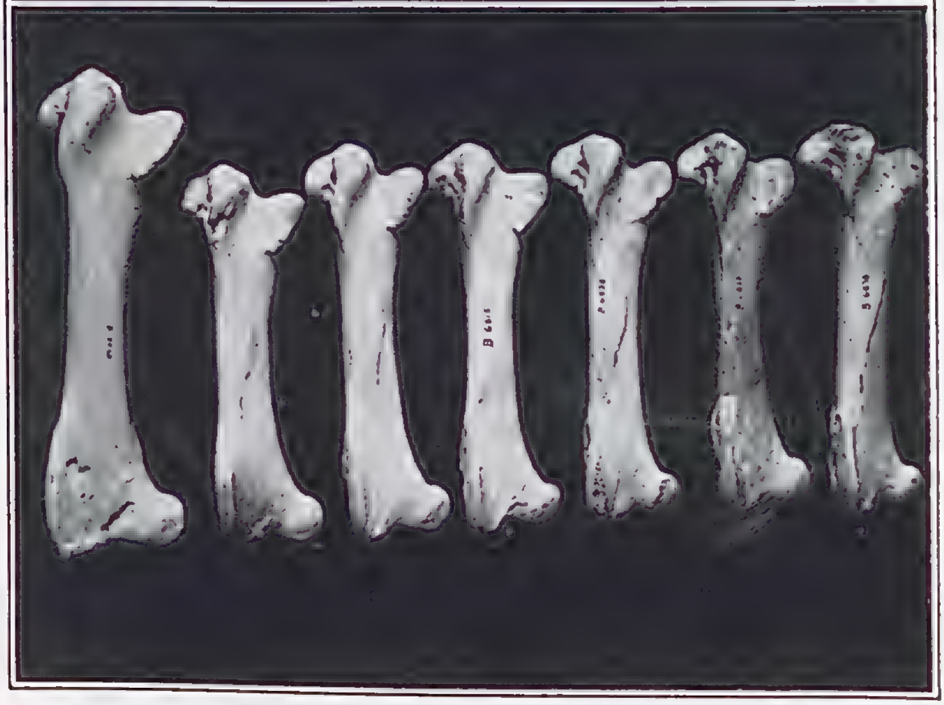


Fig. 8.—Right Femur; right, that of Mainland Emu (*Dromaius novæ-hollandiæ*); the others, Kangaroo Island Emus; B.6814, second on right.

Fig. 9.—Left Femur; left, Mainland Emu; others, Kangaroo Island Emus; B.6814, second on left.

Milne-Edwards and Oustalet state that "the anterior tibial crest is compressed, the outer anterior crest more strongly thrown backwards, the body of the tibia absolutely straight, instead of being slightly curved." This is uniformly the case throughout our series. They add, "the metatarsal groove is deeper"; this is not confirmed by our specimens.

TARSO-METATARSUS (Figs. 12 and 13).

Twenty-three bones were discovered; 14 were measured and 12 photographed. The longest right is 28.40 cm., and the shortest 27.10 cm., average 27.52 cm. The longest left is 28.40 cm. and the shortest 25.90 cm., average 27.34 cm.

In the King Island Emu, 70 specimens were measured, not all mature; the longest is 29.20 cm., and the shortest 17.45 cm., average—right 23.31 cm., left 23.57 cm. Here also the longest bone of the King Island Emu is greater than the longest of our series, and the shortest less.

Besides differences in size, the anterior groove of the bone in our specimens is straighter than in the mainland species (*Dromaius novæ-hollandiæ*).

	RIGHT.		LEFT.	
	Length.	Breadth at lower extremity.	Length.	Breadth at lower extremity.
	27.10	4.30	27.10	4.30
	27.10	3.80	25.90	4.15
	27.30	4.20	27.10	3.90
	27.40	4.10	27.30	3.80
	27.60	4.05	27.60	4.20
	27.80	3.80	28.00	4.20
	28.40	4.15	28.40	4.00
Average	27.52	4.05	27.34	4.07
Florence	24.00	—	—	—
Paris	29.00	—	—	—
D. minor Average. ..	23.31	—	23.57	—
D. novæ-hollandiæ ..	37.50	4.55	37.50	4.55

FIBULA (Figs. 14 and 15).

Thirteen of these bones were discovered; the six complete bones were measured, but all were photographed. The longest right is 22.00 cm., and the shortest 19.50 cm., average 20.25 cm. The longest left is 23.50 cm., and the shortest 19.00 cm., average 21.25 cm.

We have no measurements of the fibula of the King Island Emu. The bones cannot be distinguished, except by size, from those of the mainland species.

					Average	Florence	Paris	*D. minor* Average	*D. novæ-hollandiæ*
Right	22.00	19.50	19.50	20.00	20.25	16.20*	—	—	27.35
Left	23.50†	19.00	—	—	21.25	—	—	—	27.00

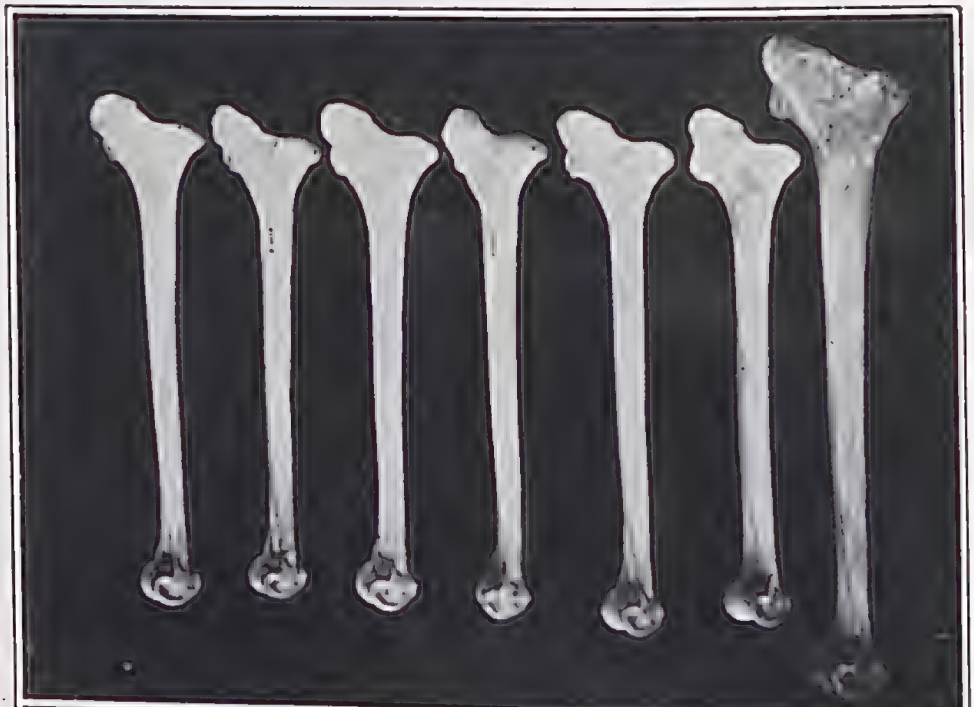
*Point broken. †Broken.

PELVIS (Figs. 16 (plate 12) and 16B (page 14)).

Eleven Pelves were discovered; 7 were measured and photographed. The longest of these is 31.60 cm., the shortest 29.00 cm., average 30.66 cm. The Florence specimen is 27.00 cm., and the Paris 34.00 cm. The average of the King Island Emu is 27.27 cm. The longest of three pelves of the mainland species measured is 41.80 cm., and the shortest 35.60 cm, very little longer than that of the Paris specimen.

Milne-Edwards and Oustalet state that "the pre-acetabular portion of the pelvis is both shorter and higher, and its upper ridge is more regularly arched, and the iliac fossa more excavated than that of the mainland Emu"; presumably they mean "proportionately." This is not so in our series. The only difference, except that of size, is that the superior surface of the post-acetabular portion is less convex than that of the mainland species.

	Length	Width at posterior end of Pubis	Width at inferior posterior termination of Ischia	From anterior border of Acetabulum to the posterior end of Pubis	From anterior border of Acetabulum to the posterior end of Ischium	Vertical diameter of Acetabulum	From middle of Acetabulum to anterior extremity of Ilium	From middle of Acetabulum to posterior extremity of Ilium	Greatest width of dorsal plane
	30.15	13.40	8.05	18.00	19.50	2.30	11.60	17.20	7.80
	29.00	—	—	—	—	2.70	11.30	17.00	7.10
	29.80	—	6.70	17.80	19.00	2.40	10.90	17.60	6.95
	30.90	—	7.60	—	19.70	2.70	10.50	18.00	7.50
	31.60	—	6.60	19.40	20.60	2.70	11.20	18.30	7.50
	31.60	—	7.00	17.60	20.20	2.60	11.50	18.40	7.30
	31.60	—	8.00	—	20.60	2.70	11.30	18.40	7.25
Average	30.66	13.40	7.32	18.20	19.93	2.58	11.18	17.84	7.34
Florence	27.00	—	—	—	—	—	—	—	—
Paris ..	34.00	—	—	—	—	—	—	—	—
D. minor Average	27.27	—	—	—	—	—	—	—	—
D. novæ-hollandiæ	40.10	10.55	7.90	24.70	25.10	2.95	16.50	22.00	9.40



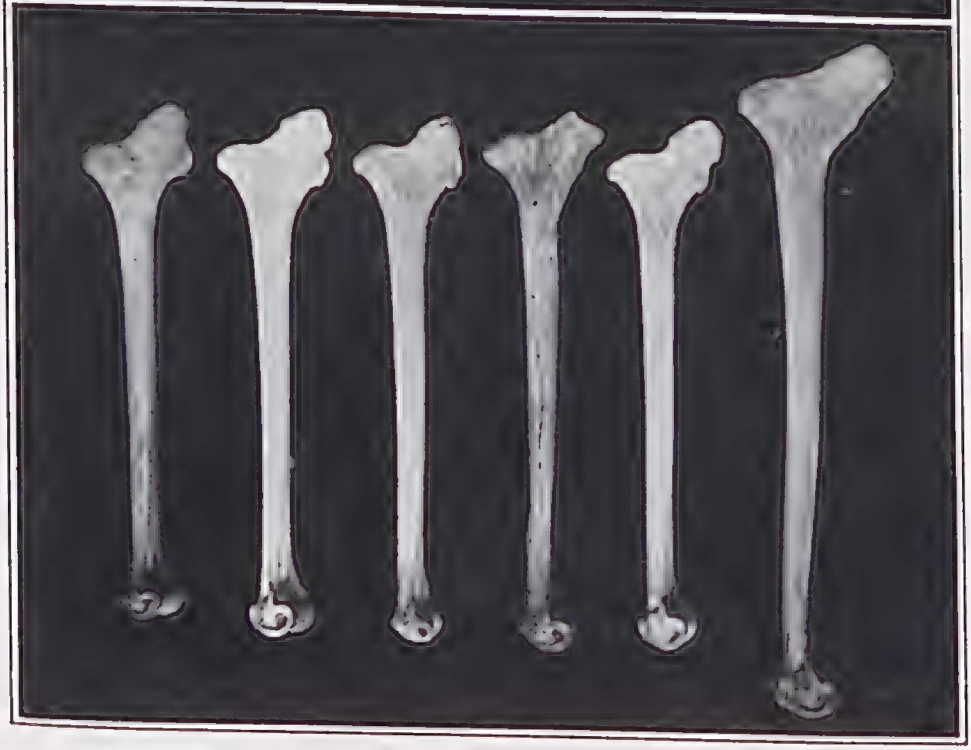
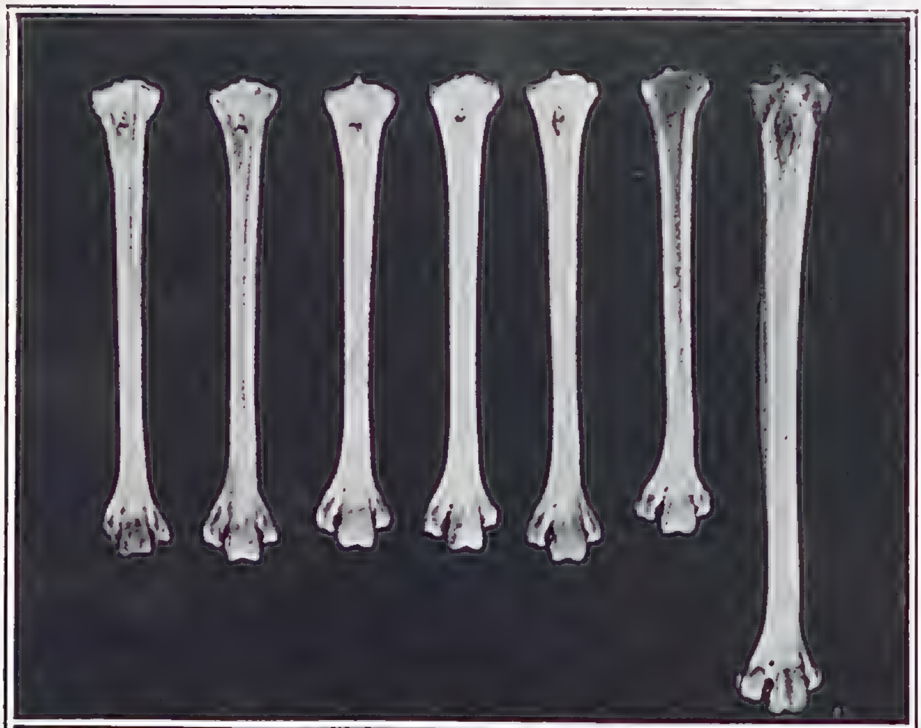


Fig. 10.—Right Tibio-tarsus; right, Mainland Emu; others, Kangaroo Island Emus; B.6814, second on right.

Fig. 11.—Left Tibio-tarsus; right, Mainland Emu; others, Kangaroo Island Emus; B.6814, second on right.



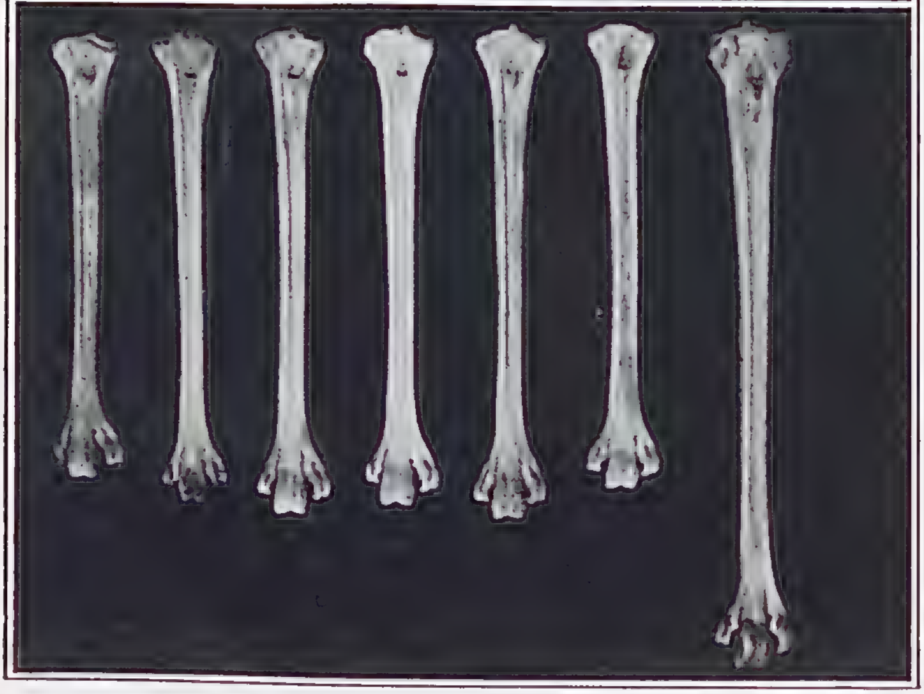


Fig. 12.—Right Tarso-metatarsus; right, Mainland Emu; others, Kangaroo Island Emus; B.6814, second on right.

Fig. 13.—Left Tarso-metatarsus; right, Mainland Emu; others, Kangaroo Island Emus; B.6814, second on right.

STERNUM (Fig. 17 (plate 13)).

Two Sterna were found; both were measured and figured.

Milne-Edwards and Oustalet state, "the sternum is evenly bulged and strongly excavated on the inner side." This is corroborated by our two specimens; both our sterna are somewhat larger than the Florence specimen, but smaller than the Paris one, so far as measurements of the latter are available for comparison.

			Average	Florence	Paris	*D minor* Average	*D. novæ-hollandiæ*
Length..	11.50	11.30	11.40	9.30	—	—	14.40
Width—							
Anterior end	10.40	10.05	10.22	8.70	12.00	—	12.10
Posterior end	6.25	6.30	6.27	5.40	8.60	—	8.45

CORACO-SCAPULA (Fig. 18 (plate 14)).

Four specimens were discovered, of which two were incomplete. Two were measured and three figured. We have no measurements of the Paris specimen for comparison. The bone does not differ in shape from that in the mainland species.

			Average	Florence	Paris	*D. minor* Average	*D. novæ-hollandiæ*
RIGHT—							
From middle of glenoid cavity to posterior end of scapula* ..	10.90	11.20	11.05	—	—	—	13.30
From middle of glenoid cavity to sternal end of coracoid	—	5.20	5.20	—	—	—	6.50
Width of sternal end of coracoid	—	—	—	—	—	—	4.70
LEFT—							
From middle of glenoid cavity to posterior end of scapula.. ..	10.50	11.30	10.90	—	—	—	13.00
From middle of glenoid cavity to sternal end of coracoid	4.80	5.00	4.90	—	—	—	6.50
Width of sternal end of coracoid	3.75	3.75	3.75	—	—	—	4.70

*Scapular portion of B. 6814 missing.

WING (Fig. 19 (plate 14)).

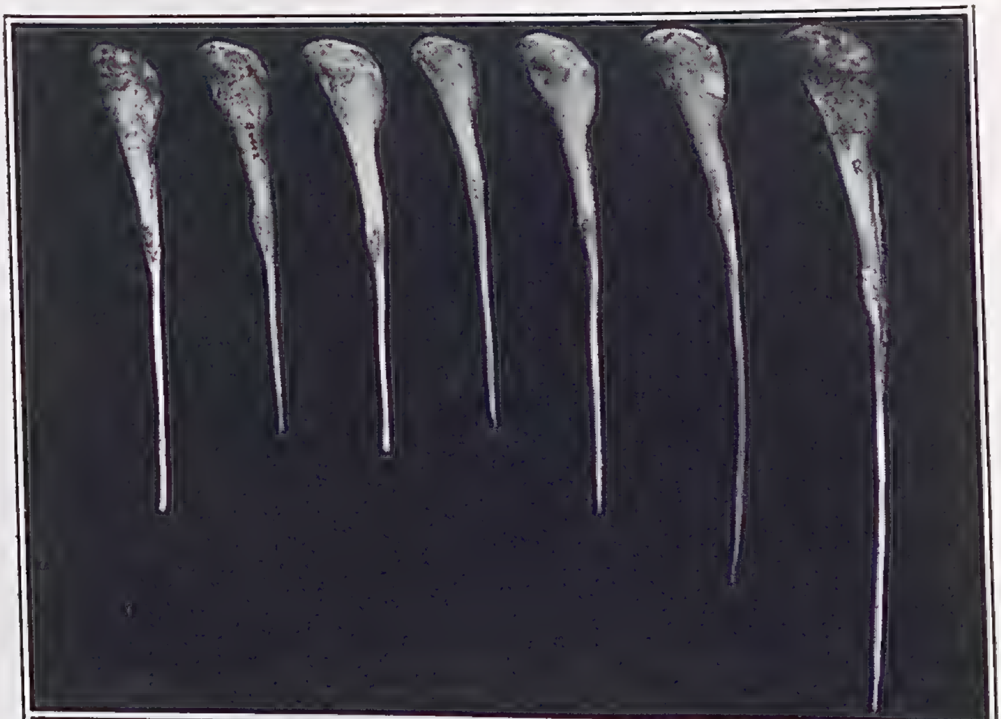
Eight specimens were discovered; two only were complete; these were measured and three figured. We have no measurements of the Paris specimen with which to compare them. The wing bones do not differ in shape from those of the mainland species.

			Average	Florence	Paris	*D minor* Average	*D. novæ-hollandiæ*
RIGHT—							
Length	—	—	—	—	—	—	8.90
Diameter at middle of shaft	—	—	—	—	—	—	0.60
LEFT—							
Length	6.90	7.45	7.17	—	—	—	8.85
Diameter at middle of shaft	0.65	0.60	0.625	—	—	—	0.55

PHALANGES (Fig. 20 (plate 13)).

A complete left foot was discovered, as well as 24 miscellaneous toe bones. The foot only was measured and figured. The inner toe is very slightly shorter than that of the Florence and Paris specimens, while the middle toe is slightly longer. The outer toe is slightly longer than the Florence, and shorter than the Paris, specimen. The first two phalanges of the King Island Emu measure respectively 4.50 and 4.00 cm. The corresponding bone in our specimen is 4.50 cm. The bones do not differ morphologically from the corresponding bones of the mainland species.

LEFT FOOT.		Florence.	Paris.	*D. minor.*	*D. novæ-hollandiæ.*
Inner Toe—					
1st Phalanx	3.80	—	—	—	5.00
2nd Phalanx	1.60	—	—	—	1.80
Uncial	2.05	—	—	—	2.30
	7.45 = 6.51 articulated	7.00	7.00	—	9.10 = 8.70 articulated
Middle Toe—					
1st Phalanx	4.50	—	—	4.50 4.00	5.90
2nd Phalanx	3.05	—	—	—	4.00
3rd Phalanx	2.00	—	—	—	2.40
Uncial	2.80	—	—	—	3.20
	12.35 = 11.20 articulated	10.60	11.00	—	15.50 = 14.30 articulated
Outer Toe—					
1st Phalanx	3.50	—	—	—	4.30
2nd Phalanx	1.60	—	—	—	1.90
3rd Phalanx	1.20	—	—	—	1.90
4th Phalanx	1.00	—	—	—	1.15
Uncial	2.40	—	—	—	2.60
	9.70 = 7.90 articulated	6.70	8.00	—	11.85 = 9.20 articulated



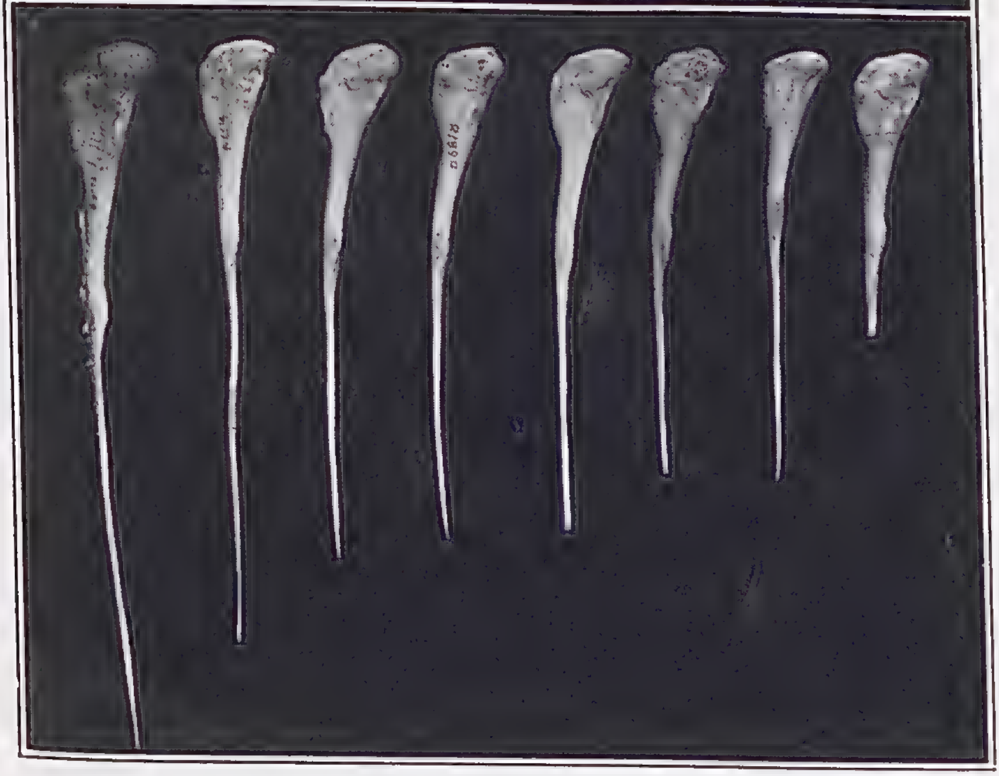


Fig. 14.—Right Fibula; right, Mainland Emu; others, Kangaroo Island Emus; B.6814, second on right.

Fig. 15.—Left Fibula; left, Mainland Emu; others, Kangaroo Island Emus; B.6814, second on left.

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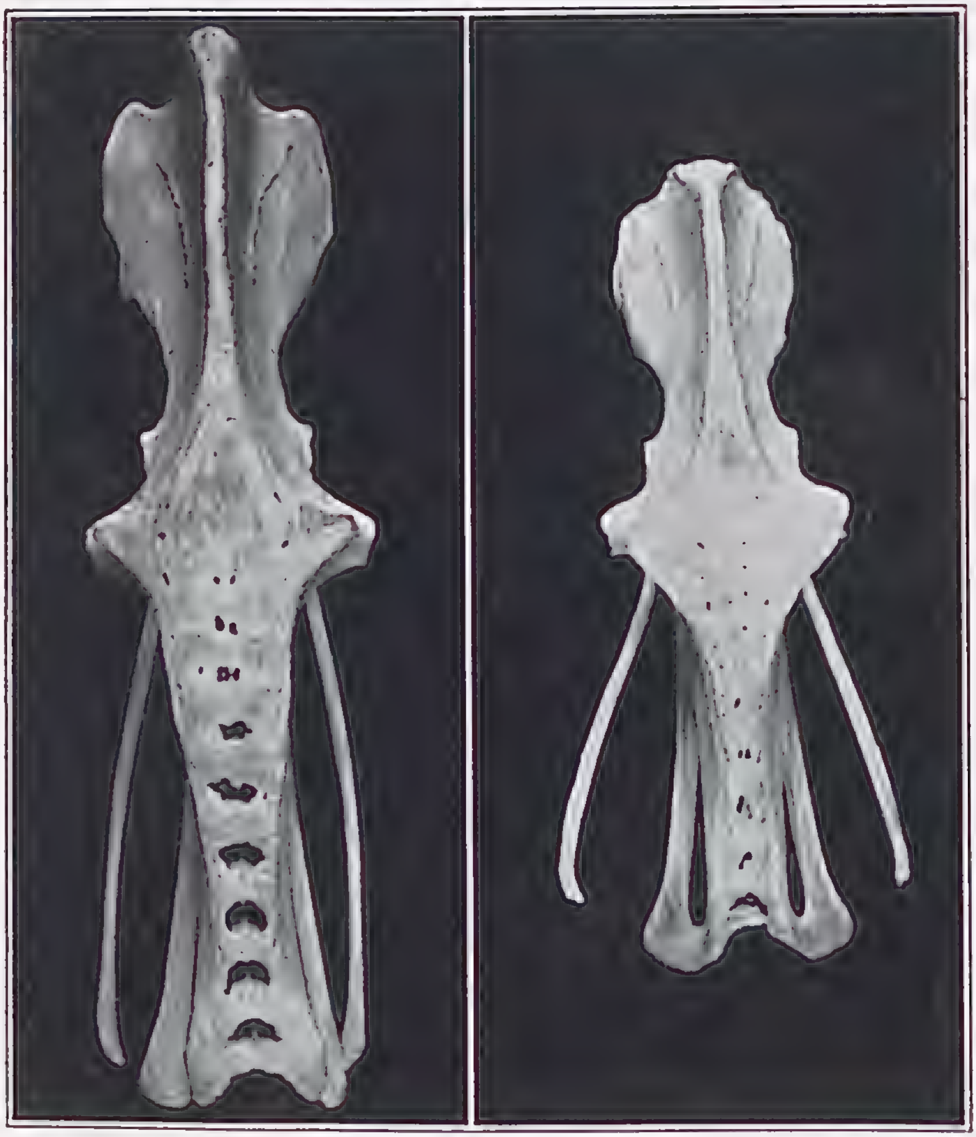


Fig. 16.—Pelves; left, Mainland Emu; right (B.6814), Kangaroo Island Emu.

(Owing to exigencies of space, all the photographs of Pelves have not been reproduced.)

VERTEBRÆ.

Sixty-five Vertebræ were discovered, 22 of which belong to one bird—four only being wanting—the Atlas, the ninth, the eleventh, and the thirteenth vertebræ. We have calculated the approximate length of these missing bones proportionately to the measurements of the corresponding bones of the mainland species.

Vertebræ.	*D. diemenianus.*	*D. novæ-hollandiæ.*	Vertebræ.	*D. diemenianus.*	*D. novæ-hollandiæ.*
	cm.	cm.		cm.	cm.
Atlas . .	**0.30 approx.**	0.35	15th. . .	3.30	4.30
Axis. . .	**1.30**	1.40	16th. . .	3.20	4.35
3rd. . .	**1.60**	1.95	17th. . .	3.50	4.40
4th. . .	**1.70**	2.15	18th. . .	3.50	4.20
5th. . .	**1.90**	2.30	19th. . .	3.50	4.30
6th. . .	**2.05**	2.50	20th. . .	3.60	4.00
7th. . .	**2.30**	2.85	21st. . .	3.55	3.85
8th. . .	**2.50**	3.20	22nd. . .	3.40	3.85
9th. . .	**2.60 approx.**	3.50	23rd. . .	3.35	3.85
10th. . .	**2.80**	3.80	24th. . .	3.20	4.00
11th. . .	**2.95 approx.**	4.00	25th. . .	3.15	4.15
12th. . .	**3.05**	4.15	26th. . .	3.20	3.90
13th. . .	**3.10 approx.**	4.25			
14th. . .	**3.10**	4.30		71.70	89.85

Length of vertebral column .. Florence, 104.00 cm.; Paris, 119.00 cm.

RIBS (Fig. 21 (plate 15)).

Ninety-three Ribs were discovered. The ribs of a complete left side are figured. They do not differ from the corresponding bones of the mainland species, except in size.

CRANIUM (Figs. 22 and 22B (page 14)).

Only one skull was discovered and photographed with portion of the lower mandible of another bird. This skull differs materially in shape from that of the mainland species, but approximates very closely to that of the King Island Emu, having the same domed cranium, which at once differentiates it from *Dromaius novæ-hollandiæ*. Our skull measures in length 12.80 cm.; the Florence skull is given by Giglioli as 12.10 cm; the Paris skull is given by Milne-Edwards and Oustalet as 17.00 cm., which is more than 1 cm. longer than the longest skull of three *Dromaius novæ-hollandiæ* in the South Australian Museum, and 4.20 cm. longer than our skull of *Dromaius diemenianus*. Our skull is slightly higher than that of *Dromaius minor*, and slightly shorter from occiput to frontal suture; the inter-orbital space is somewhat larger. The great size of the skull of the Paris specimen seems to suggest either that a mistake has been made in the measurement or that the skeleton is a composite one, the original skull

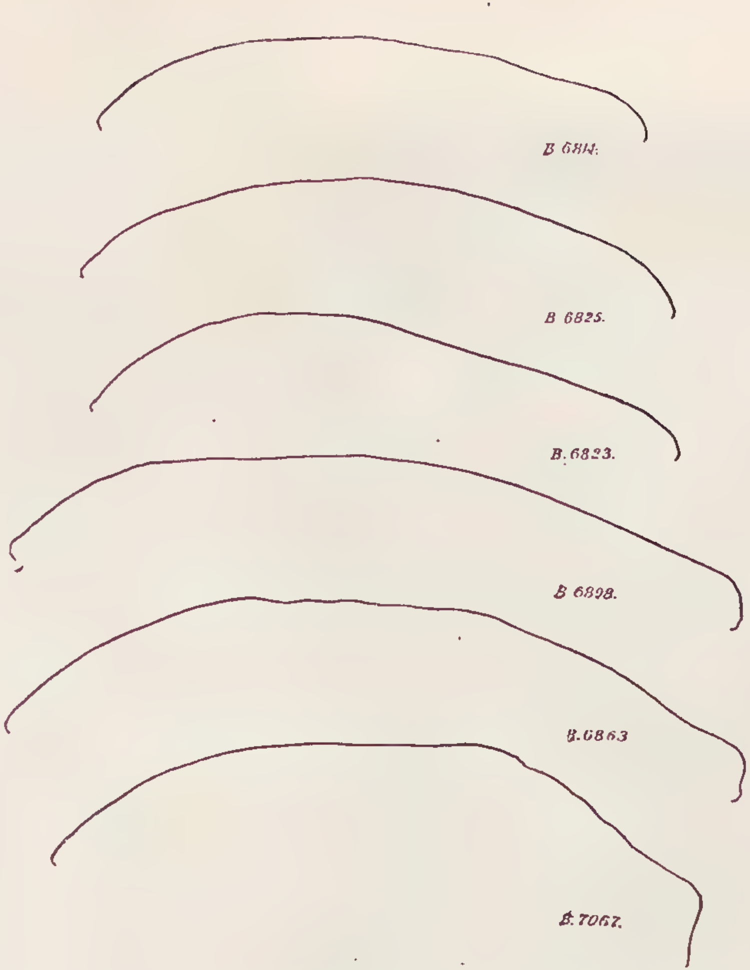


Fig. 16B.

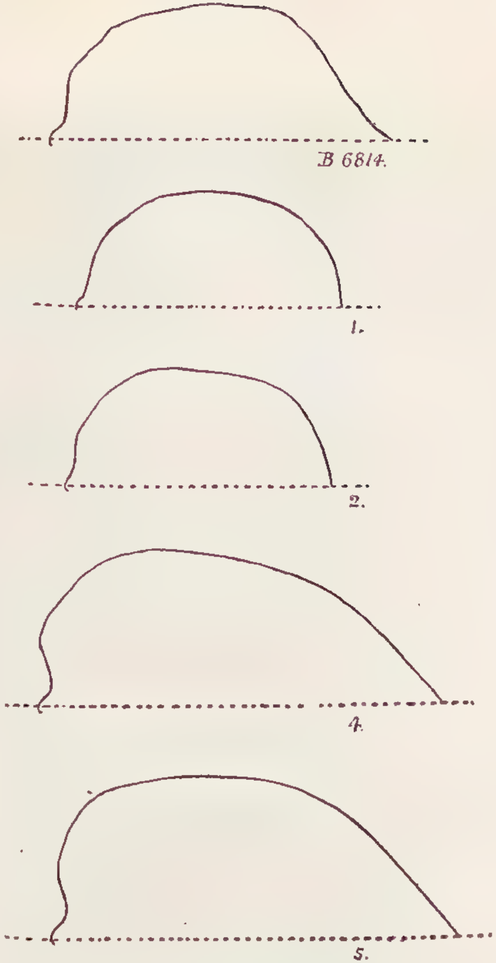
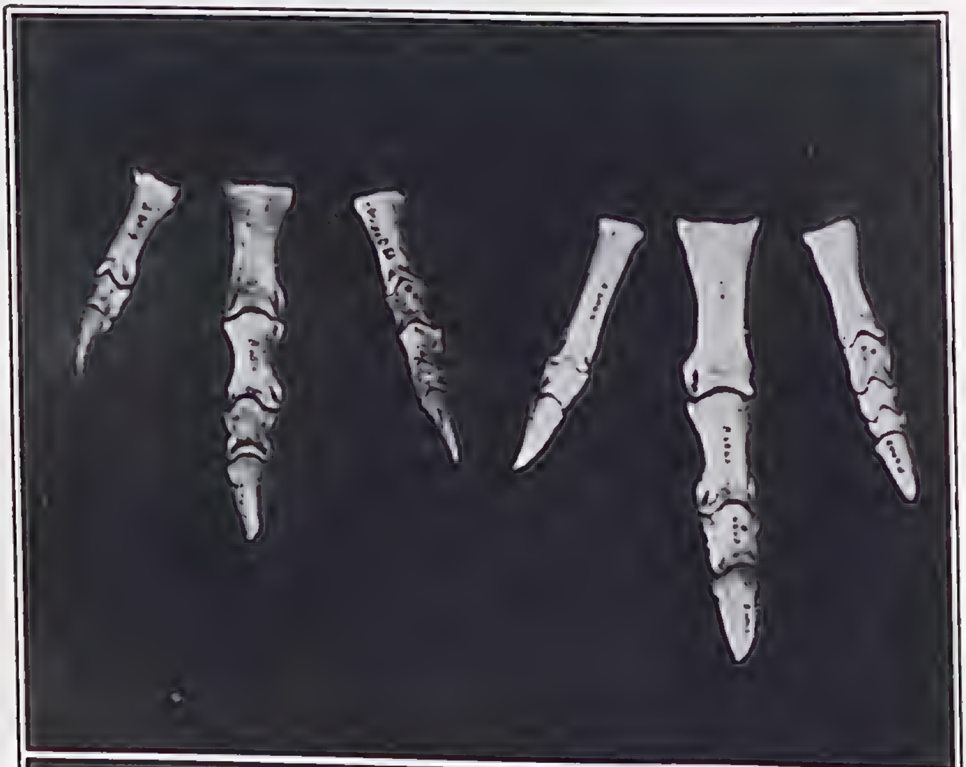


Fig. 22B.

Fig. 16B.—Contours of the upper surface of Pelves; Nos. B.6814, 6825, and 6823, Kangaroo Island Emus; Nos. B.6898, 6863, and 7037, Mainland Emu (*D. novæ-hollandiæ*).

Fig. 22B.—Contours of Skulls; No. B.6814, Kangaroo Island Emu; others after Spencer and Kershaw. (1 and 2 King Island Emus, 4 and 5 Mainland Emus.)



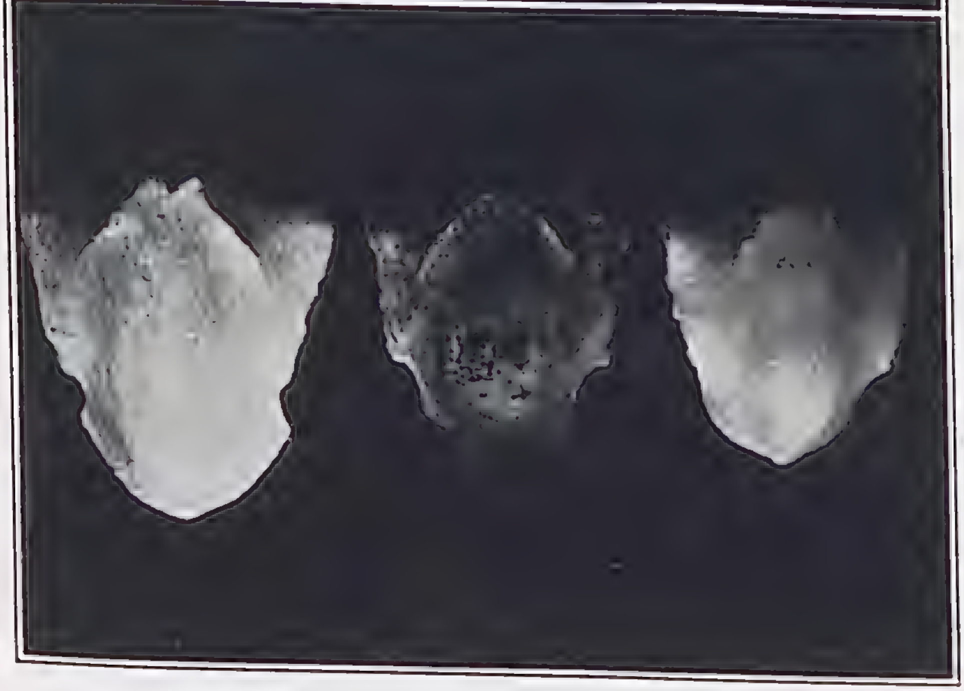
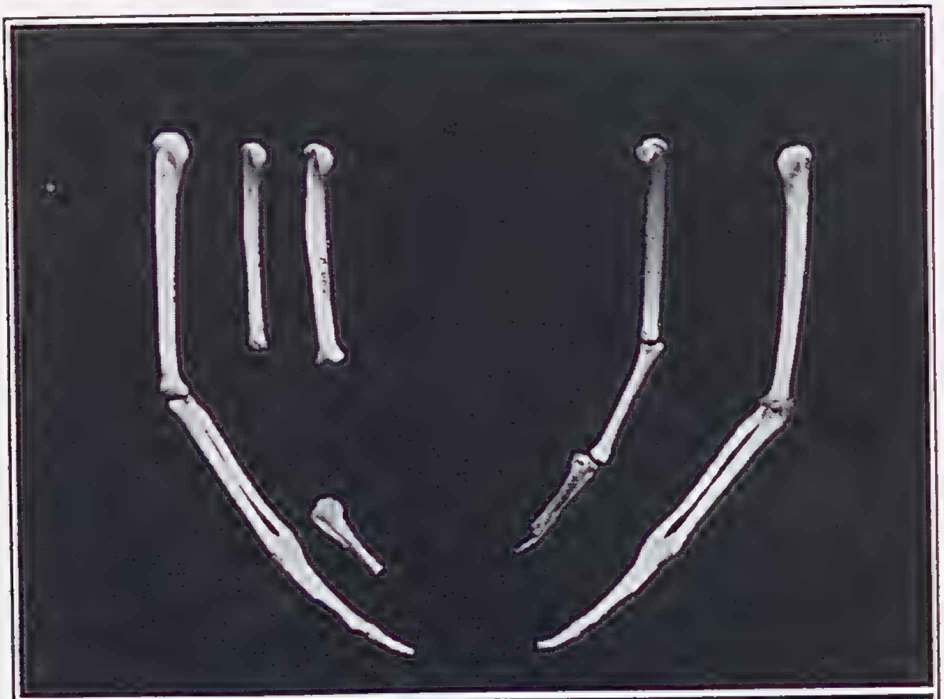


Fig. 20.—Left Foot; right, Mainland Emu; left (B.6814), Kangaroo Island Emu.

Fig. 17.—Sternum; left, Mainland Emu; others, Kangaroo Island Emus; B.6814 in centre.



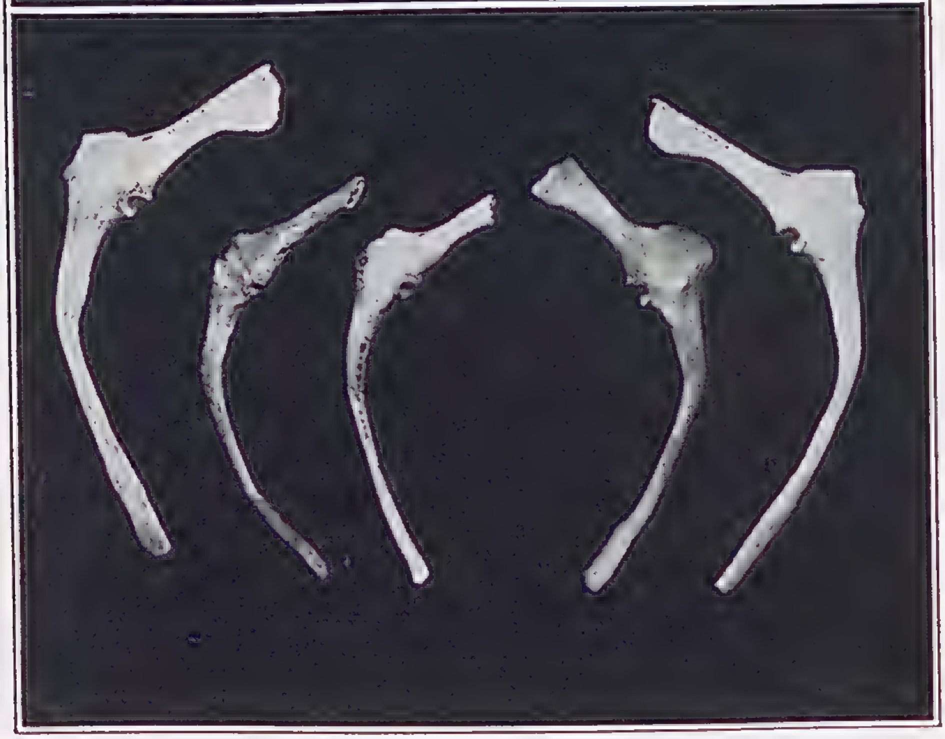


Fig. 19.—Wing; outside (2), Mainland Emu; others (3), Kangaroo Island Emus; B.6814, second on right.

Fig. 18.—Coraco-scapula; outside (2). Mainland Emu; others (3), Kangaroo Island Emu; none of B.6814.

having been replaced by that of some other species. It may even be that the statement on the label on the mounted specimen, "the skeleton is in the Anatomy," is correct, the bones left in the skin having been replaced by those of another bird. If, as Giglioli states, the wooden models of the wings of the skeleton in the Florence Museum are an exact copy of those of the Paris specimen, it would be proof of its composite nature. As we know of no figure of this skeleton nor any description of the wing bones, and as a request to the Paris Museum for a photograph of the skeleton met with no response, the settlement of this point must be left to some one having an opportunity of studying it in Paris.

	D. diemenianus.	Florence.	Paris.	*D. minor* Average.	*D. novæ-hollandiæ*
Total length	12.80	12.10	17.00	—	15.85
Total breadth across the quadrates	6.30	—	—	—	7.60
Total height	4.55	—	—	4.25	5.55
Occiput to frontal suture	5.70	6.5	8.00	5.93	6.40
Foramen magnum—					
Vertical	1.00	—	—	—	1.00
Horizontal	1.05	—	—	—	1.10
Width at posterioral orbital process	5.95	5.80	6.60	—	6.75
Interorbital space..	2.70	2.00	2.90	2.45	2.60
Length of bill from premaxillary bone to tip.	6.20	—	7.40	—	7.80
Lower mandible—					
Length	—	11.10	13.40	—	14.20
Width of angles of jaw	—	—	—	—	7.30

CARPO-METACARPUS.

	D. diemenianus.	*D. novæ-hollandiæ.*
Right—length	3.05	4.30
Left—length	—	4.40

ULNA.

	D. diemenianus.	*D. novæ-hollandiæ.*
Right—length	4.55	6.00
Left—length	—	6.20

RADIUS.

	D. diemenianus.	*D. novæ-hollandiæ.*
Right—length	—	6.00
Left—length	—	6.20

HEIGHT.

By taking the average total length of the leg bones of the Kangaroo Island Emu, and the King Island Emu, and comparing them proportionately with the actual leg measurement of a skeleton of the mainland Emu, of which the height from the ground to the highest point of the pelvis was 98 cm., we calculated that the average height of the Kangaroo Island Emu was 75.51 cm., and of the King Island Emu 66.54 cm. As immature bones were included in the measurements by Spencer and Kershaw, the average height of an adult King Island Emu would probably be greater.

	Average *D. diemenianus.*		Average *D. minor.*		Actual measurement, *D. novæ-hollandiæ.*	
	Right.	Left.	Right.	Left.	Right.	Left.
Femur	17.76	17.75	16.35	16.39	22.35	22.05
Tibio-tarsus	32.97	33.00	29.30	29.16	41.70	41.70
Tarso-metatarsus ..	27.52	27.34	23.31	23.57	37.50	37.50
	78.25	78.09	68.96	69.12	101.55	101.25

Kangaroo Island Emu *(D. diemenianus)*—As 101.55:78.25::98:75.51 cm.

King Island Emu *(D. minor)*—As 101.55:68.96::98:66.54 cm.

There are four morphological characteristics which differentiate the bones of the Kangaroo Island Emu from those of the Mainland Emu (*Dromaius novæ-hollandiæ*):—

1. The straight Tibio-tarsus.
2. The straight anterior groove of the Tarso-metatarsus.
3. The flatter upper surface of the Pelvis.
4. The domed Cranium.

In all other respects, the bones are alike, except in size.

We are of opinion that there is no characteristic by means of which the Kangaroo Island Emu can be distinguished from the King Island Emu, although it seems possible that the King Island Emu was a somewhat smaller bird, but this is by no means certain, for in several instances individual bones of the King Island Emu are larger than any we possess of the Kangaroo Island Emu, as shown in this article. The close resemblance between these two small Emus on such widely-separated islands (430 miles apart) suggests to us that it was the original Australian Emu, the form of which has been preserved by isolation. In which case, both King Island and Kangaroo Island must have been cut off from the mainland before the separation of Tasmania, the Emu of which seems,

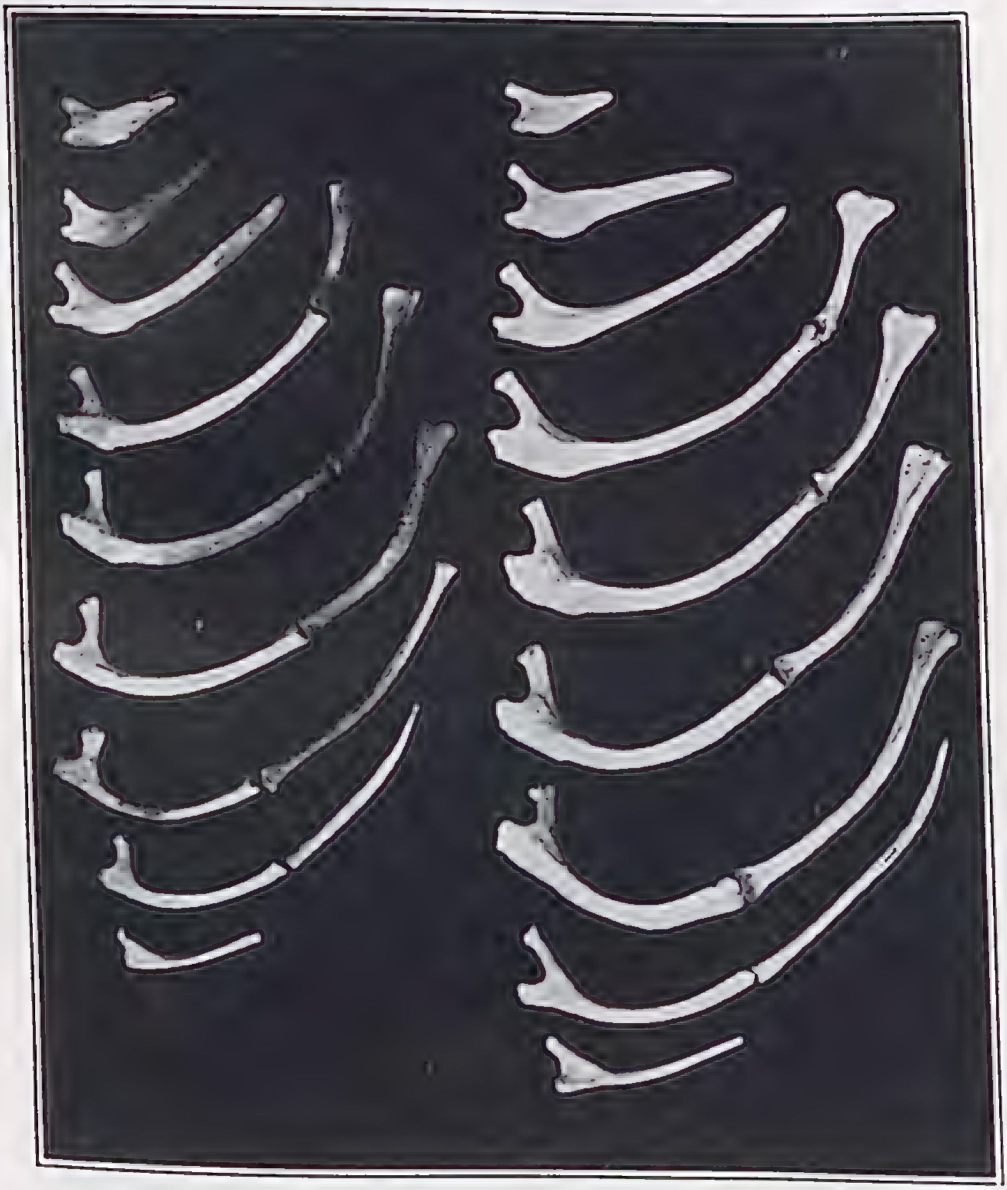


Fig. 21.—Ribs; right, Mainland Emu; left, Kangaroo Island Emu (B.6814).

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NATIONAL MUSEUM VICTORIA

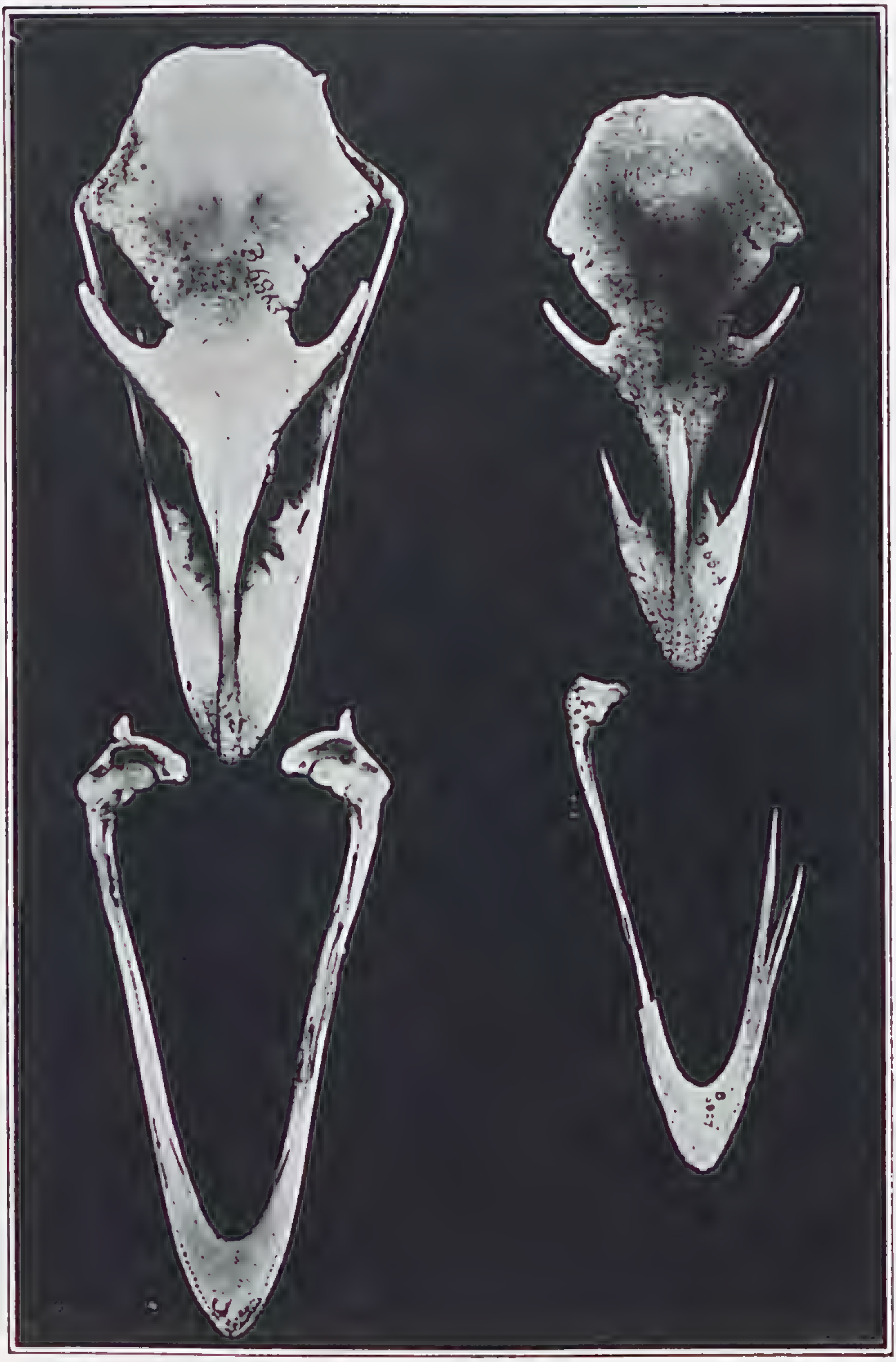

Fig. 22.—Cranium; left, Mainland Emu; right, Kangaroo Island Emu (B.6814).
Lower Mandible; left, Mainland Emu; right, Kangaroo Island Emu (B.6827).

from what little we know of it, to have closely resembled the mainland species *(Dromaius novæ-hollandiæ)*.

We have to thank Mr. Edgar R. Waite for the tracings of the skull and pelves of our specimens, and Mr. R. Cotton for the photographic plates.

COMPARATIVE LENGTH OF BONES.

	Kangaroo Island.		King Island.	
	Longest.	Shortest.	Longest.	Shortest.
Femur—				
Right	18.20	17.30	18.60	13.00
Left	18.20	17.50	18.00	13.00
Tibio-tarsus—				
Right	33.60	32.10	35.40	26.80
Left	33.70	32.00	32.80	26.60
Tarso-metatarsus—				
Right	28.40	27.10	27.80	17.40
Left	28.40	25.90	29.20	19.90
Pelvis—				
Length	31.60	29.00	29.20	24.90
(Median Toe)—				
1st Phalanx	4.50	—	4.50	4.00

List of Bones of *Dromaius diemenianus* (Kangaroo Island Emu) in the South Australian Museum:—

Museum No.	Description.	Where Found.	Date.	Donor.
B				
6843	1 Tibio-tarsus	The Brecknells	Jan., 1903	Prof. W. Howchin
6844	1 Tarso-metatarsus			
6845	Portion of a Femur	———	Sept. 12, 1907	F. W. Giles
6846	2 Portions of Tibio-tarsi.			
6847	3 Fragments of Vertebræ	Cape du Couedic	Oct. 9, 1907	F. W. Giles
6848	Portions of a Femur (young bird)			
6849	1 Toe bone			
6832	4 Humeri	Kelly's Hill	Nov., 1925	E. Burgess
6833	29 Ribs			
6834	4 Pelves			
6835	7 Toe bones			
6836	Portions of skull			
6837	2 Coraco-scapulæ			
6838	4 Femora			
6839	4 Tibio-tarsi			
6840	3 Tarso-metatarsi			
6841	13 Vertebræ			
6842	3 Fibulæ			
6850	3 Femora	Nr. Eleanor River	Jan. 28, 1926	N. B. Tindale
6851	4 Tibio-tarsi			
6852	3 Tarso-metatarsi			

COMPARATIVE LENGTH OF BONES—*Continued*

Museum No.	Description.	Where Found.	Date.	Donor.
6853	4 Tibio-tarsi	Kelly's Hill	Feb. 6, 1926	H. M. Hale and N. B. Tindale
6854	1 Portion of a Pelvis			
6814	Bones of one individual	Kelly's Hill	May 21, 1926	E. Burgess
6815	8 Femora, and 1 Femur shaft	Kelly's Hill	May 22, 23, 1926	E. Burgess
6816	10 Tibio-tarsi; one broken			
6817	10 Tarso-metatarsi and 1 shaft			
6818	8 Fibulæ			
6819	36 Ribs			
6820	3 Humeri			
6821	Part of a Carpus			
6822	26 Vertebræ			
6823	5 Pelves and 4 portions of Pelves			
6824	1 Sternum			
6825	1 Coraco-scapula			
6826	1 Coracoid			
6827	Portions of a skull			
6828	Portions of a skull			
6829	9 Toe bones			
6830	11 Cervical ribs			
6889	3 Femora	Kelly's Hill	July 24, 1926	Fauna and Flora Board of South Australia
6890	3 Tibio-tarsi			
6891	4 Tarso-metatarsi			
6892	4 Vertebræ			
6893	1 Coraco-scapula			
6894	1 Pelvis and a portion of a Pelvis			
6895	7 Ribs			
6896	1 Portion of a Lower mandible			

SUMMARY OF THE BONES.

Skull	1, and 5 portions of skulls
Vertebræ	65, and 3 portions
Pelves	11, and 6 portions
Sterna	2
Ribs	82
Cervical Ribs	11
Femora	20, and 3 portions
Tibio-tarsi	28, and 2 portions
Tarso-metatarsi	23, and 1 portion
Fibulæ	13
Coraco-scapulæ	4
Coracoid	1
Humeri	8
Radius	1
Carpus	2 parts
Toe bones	36

The Nomenclature of the Kangaroo Island Emu.

From The Official Checklist of the Birds of Australia, Royal Australasian Ornithologists' Union, 2nd Edition, 1926.

Dromaius diemenianus, Kangaroo Island Emu.

Kangaroo Island (extinct); one skin known.

Casuarius diemenianus, Jennings, Orn., 382, 1827; Kangaroo Island.

a. *D. ater* (not Vieillot, 1817), Vieillot, Gal. des Ois., 2, 79, 1825. Kangaroo Island.

b. *D. peroni*, Rothschild, Extinct Birds, 235, 1907; Kangaroo Island.

c. *D. parvulus*, Mathews, Birds of Australia, 1, 19, 1910 (see Penny Cycl., 23, 145, 1842); Kangaroo Island.

d. *Dromiceius spenceri*, Mathews, Nov. Zool., 1912, 176; King Island = Kangaroo Island.

Migrants and Others, 1927-28.—The Fantailed Cuckoo (*Cacomantis flabelliformis*) began his trilling notes on 22nd August, and on 23rd migrant Australian Pipits (*Anthus australis*) arrived in a grass-paddock near the beach. A female Blue-Wren (*Malurus cyaneus*) sang a hurried strain from the top of a small bush. On 29th of the month Welcome Swallows (*Hirundo neoxena*) arrived, but were not plentiful until 3rd September. The Striated Pardalote (*Pardalotus striatus*) was calling "Pick-it-up" on 29th August from the same Gum-tree at back of cottage in which he makes a temporary sojourn each spring. The first pair of Summer-Birds or Black-faced Cuckoo-Shrikes *(Coracina novæ-hollandiæ)* of the season, were sighted on morning of 30th September coming from a north-westerly direction. Wind was north-easterly at the time, with rain threatening. This came later in the day, and at 3 p.m., when the atmosphere was clearer, the first Pallid-Cuckoo (*Cuculus pallidus*) made himself heard. The Bronze Cuckoo *(Lamprococcyx plagosus*, or *Chalcites basalis)* was not heard until the following month (8th October). A fledged individual of the Bronze was observed being fed by a pair of Blue Wrens on 28th January, 1928. On that date also the adult Pallid and Fantailed Cuckoos were heard for the last time. The fledged young of both these species may be observed from the end of January onwards, sitting about on wires or fences, but quite silent. The young Pallids are particularly conspicuous on account of the large patches of silvery plumage on head and wings, giving a beautiful appearance to the birds. At Bell's Parade, Latrobe, on 13th February, a male Blue Wren was observed half-way through his moult; on 20th, same month, the male Blue Wren, in the garden at Devonport, had lost almost all his colour. So far, no Spine-tailed Swifts (*Hirundapus caudacutus*) have been observed this season.—H. STUART DOVE, F.Z.S., West Devonport, Tas. (6/3/28).

Notes Made During a Holiday Trip to New Caledonia

By Dr. J. A. LEACH, C.M.B.O.U., C.F.A.O.U., Sometime President R.A.O.U.

Opportunity for a holiday of three weeks in New Caledonia having been rendered possible, Melbourne was left, in company with Dr. Brooke Nicholls, on Thursday, October 20th, 1927. It was after 4 p.m. the next day when the French s.s. Dupleix, 1465 tons, left Sydney. Outside the Heads, a stiff south-easterly breeze blew, with a consequent considerable movement of water and boat. Excepting a short daily period on a sheltered portion of the deck, little time was spent away from our cabin until New Caledonia was in sight. The return voyage, on the other hand, was most pleasant, with light breezes and a smooth sea. Observations of those ocean frequenters—Albatrosses, Petrels, Terns, and Skuas—were made. Notes on the birds seen are arranged in the order of *The Official Checklist of the Birds of Australia* (second edition), and so far as possible the names of that list are used. Considerations of space caused the deletion of most of the impressions of a delightful trip.

Letters of introduction secured the invaluable assistance of Mr. A. Huet, managing director of the *Nouvelle Compagnie Forestiers de Caledonie.* He acted as interpreter in an interview with His Excellency, Monsieur Joseph Guyon, Governor of New Caledonia and dependencies. M. Guyon was interested in our proposals to see some of the country districts, and drew up an itinerary for a five days' excursion to Bourail. This provided us with a profitable and pleasant experience.

After a day in Noumea, we travelled south, with Mr. Huet, through interesting country, along beautiful and fertile valleys and over the rugged and highly metalliferous spurs of the famous Mont d'Or (Mount of Gold) to the Baie et Riviere de Pirogues (Bay and River of Canoes). On Friday, with the manager of the sawmill, Mr. Howard Ross, a fellow Australian, thirty-five kilometres (22 miles) were travelled to the railhead, where, in the dense tropical brushes greatly resembling those of river valleys in eastern tropical Queensland, magnificent kauri trees were being felled.

Our holiday proved most enjoyable, although it was too short to permit work of value. We found many residents interested in natural history, particularly in corals, shellfish, fish, and birds.

The island, about one-quarter of the size of Tasmania, consists of imposing, sometimes barren, mountains up to 5000 feet in height, and of fertile areas in the extensive lowlands and valleys. The beautiful and extensive harbour of Noumea represents a more completely drowned area than does the equally beautiful Sydney Harbour. Only the tops of the mountains are left as the hilly islands opposite the town and dotted about the extensive lagoon. Surrounding all is a wonderful coral reef, second in size only to the Great Barrier Reef of north-eastern Australia. New Caledonia had been a convict station, but that was long ago.

The language is French, though generally one or more persons understand enough English to help a traveller. Usually the leading families give sons and daughters a finishing period at School in Sydney, and inability to understand spoken French was not a serious handicap. New Caledonia, with its tropical climate and every breeze a sea-breeze, was just enjoyably warm. Except during the wet season in January, February, and March, the climate is pleasant and equable. New Caledonia is sure to become, during June, July, August and September, a favourite tourist and health resort for residents of southern Australia.

The outstanding feature of the trip, ornithologically, was the recognition of old friends in new surroundings, and the strengthened realization that Australia once extended much further to the east. The very ancient island of New Caledonia was once part of the continent, and justifiably is now a part of the Australian zoological region.

There is no record from New Caledonia of any member of the first sub-class of birds—the primitive "running birds" —including Emu (Australia), Cassowaries (North Queensland and islands to the north), Kiwis (New Zealand), Ostrich (Africa to Palestine), and Rheas (South America). Neither has any member of the second sub-class of birds, composed entirely of the unique southern Penguins, been recorded from the island.

All other birds are grouped as " flying birds," though a few, living under special conditions, are flightless; still, their relatives fly, and they are classified with flying birds. The first large group of flying birds consists of the "scratching birds," including domestic poultry. The only member of this important group dwelling naturally in any of the dependencies of New Caledonia is the mound-builder restricted to the New Hebrides, where the eggs and habits of this famous bird (*Megapodius layardi)* are well known to the residents.

The Painted Quail *(Turnix varia)* of Tasmania and southern and eastern Australia has been recorded from New Caledonia; though sportsmen shown a coloured figure did not recognise the bird. Indeed, some referred to the Quail and Partridge of Europe. At best, the Painted Quail seems an accidental visitor. How a non-migratory bird crossed many hundreds of miles of open ocean is a puzzle; possibly some caged birds escaped. The Painted Quail is a Button- or Bustard-Quail with three toes, the hind-toe being absent.

Of the five species of Pigeons definitely recorded from New Caledonia, four are confined to the island and adjacent islands. One—the small, widely distributed, Green-winged Pigeon *(Chalcophaps chrysochlora)*—is found from Timor, the Moluccas, northern and eastern Australia to New Caledonia, the New Hebrides, and Lord Howe Island. It was common in suitable localities such as Plum Farm.

The Giant Pigeon *(Phaenorrhina goliath)* is confined to New Caledonia and the Isle of Pines. It is one of the largest of Pigeons, and well deserves its suggestive specific name *goliath*. The booming notes, well known to our driver, and resembling those of the Wonga Pigeon of eastern Australia, were heard; we did not locate the birds in the tropical brushes. Near Bourail, this bird was seen in captivity. The other species of Pigeons listed for New Caledonia are *Ptilinopus greyi* (New Caledonia and Loyalty Islands), *Columba hyphenochroa* (New Caledonia and Loyalty Islands), and *Drepanoptila holosericea* (New Caledonia and the Isle of Pines), with legs and feet feathered practically to the toes, and the remarkable flight feathers of the wings bifid (divided into two at the tip).

Of the five members of the family of Rails listed by Sarasin and Roux* for New Caledonia, three are found in Australia; the fourth is related to the Swamp Hen of Australia and New Zealand; whilst the fifth is a flightless, small-winged Rail *(Tricholimnas lafresnayanus)*, confined to New Caledonia. The bird related to an Australian species is the large and conspicuous, red-billed and red-legged *Poule sultane* ("fowl, sultan"). It resembles closely the Australian black-backed Swamp Hen or Bald Coot, a large bird, ranging over Australia except to the south-west, Lord Howe Island, Norfolk Island, and New Zealand, where it is called the Pukeko. Vieillot, a celebrated French ornithologist in 1819, named *Porphyrio calvus,* the Swamp Hen, ranging from Sumatra and Celebes to Samoa; and *P. cyanophalus*, the blue-backed bird from the south-west of Western Australia. In 1820, Temminck, the great Dutch ornithologist, named the Australian and New Zealand bird *P. melanotus* (black back). Some authorities consider these three species intergrade, forming one widely spread species, the first published name of which was *P. calvus.* The three Rails common to Australia and New Caledonia are the small, sombre-coloured Spotless Crake or Leaden Water-Rail (*Porzana plumbea*), the larger White-browed Crake (*Poliolimnas cinereus*), and the Banded Rail or Landrail (*Hypotænidia philippensis*). The three species range widely, mainly over the islands from the Philippine Islands and the Malayan Archipelago, through New Guinea, Australia and Tasmania, New Zealand and the Pacific Islands to the Pelew Islands, Fiji and Samoa. The Banded Rail was seen close to La Foa, as well as in captivity.

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*Sarasin and Roux, Nova Caledonia Forschungen in Neu-Caledonien und auf den Loyalty—Inseln, A. Zoologie, Vol. 1.

The little Grebe (*Podiceps ruficollis*), found practically throughout the eastern hemisphere, was listed for New Caledonia by Sarasin and Roux, though Mr. Mathews, in *Systema Avium Australasianarum*, Pt. I. (1927), did not include any island east of New Guinea in its range; nor did he list a Grebe from any island, except New Zealand, that was to the east of New Guinea. We neither saw nor heard anything of it. Local sportsmen did not know this small diving Dabchick found throughout most of the eastern hemisphere.

Small Storm-Petrels—Mother Carey's chickens, birds of ill-omen with sailors—were seen on two windy days when a brief stay on deck permitted a short period of observation. They fluttered moth-like low along the troughs of the waves, and were present in numbers on the third day out. When viewed through field-glasses, the white rump was conspicuous in contrast with the dusky plumage.

Mutton-birds, dark coloured Petrels or Shearwaters (*Puffinus sp.?*), were often seen rising and falling in their characteristic, tireless flight. In the bright morning sun some appeared a golden brown with darker brown wings. Apparently, they worked in conjunction with Dolphins, so-called "Porpoises" (Porpoises are not found in Australian waters). The birds seemed indifferent to the presence of the ship. At times, especially on the last morning at sea. Dolphins, in pursuit of fish, were rising alongside, and were passing under, the ship. The Mutton-birds were then very close to us. A few small, white breasted Petrels, or Shearwaters (*Puffinus sp.?*) were also seen. Old burrows of Mutton-birds on Redika Island, in the extensive lagoon, south of New Caledonia, had not, on November 6th, 1927, been prepared for occupation, though burrows on Mast Head Island, Capricorn Group, over 750 miles west, were occupied about three weeks earlier in the season when the R.A.O.U. party camped there in 1910.

Albatrosses were common during the earlier part of the outward voyage and the later part of the homeward voyage. The large Snowy Albatross (*Diomedea chionoptera*) and the Wandering Albatross (*D. exulans*) were conspicuous. On the third day out, two Sooty Albatrosses (*Phœbetria palpebrosa*) were included in the company of birds following the steamer. Albatrosses left us on the Sunday night; Noumea was reached on Tuesday about 6 p.m. On the return voyage, Noumea was left on Wednesday, November 16th, about 5 p.m. On Friday, about 10 a.m., a large Albatross was seen on the water. About 11.30, it was flying over the stern; the white body, black-tipped wings and dark brown tail showed that it was a Wandering Albatross. It was soon joined by a similar bird. About 4 o'clock a bird of the same size and style, but with a dark upper surface and a dark patch on the chest appeared—evidently it was a Wandering Albatross in immature plumage. These Albatrosses found difficulty in trimming their planes to soar in the gentle breeze; to gather way they often flapped their wings. The following day the breeze was stronger, and the birds easily developed speed to encircle the vessel with little flapping of the long, narrow, ribbon-like wings.

A smaller Albatross, having a black bill with whitish crest, tip and lower edge, a dark upper surface to the body and to the upper side of the wings, seemed to be the Grey-headed Albatross (*D. chrysostoma*), or Mollymawk, a name sometimes given to the smaller Albatrosses. By some people the correct name, Malle-muck, is confused with Hawk, and the bird is called wrongly a Mollyhawk.

The valuable drawings by Dr. W. MacGillivray in *The Emu* for October, 1927, will prove helpful to persons identifying Albatrosses at sea.

The little white-breasted Cormorant (*Microcarbo melanoleucus*) was seen by both Dr. Nicholls and myself on the river near Bourail. It soon dived, and was lost to sight. Cormorants were very rare in New Caledonia, and illustrations did not excite comment. These almost cosmopolitan fishing-birds are strangely absent from Polynesia, where fish are particularly abundant. Mr. Mathews did not list a Cormorant for New Caledonia or neighbouring islands. New Zealand is the headquarters of the family.

Two Australian Gannets (*Sula serrator*), on the morning of Sunday, November 20th, with white bodies, black wing-quills and buff nape, were fishing as we neared Sydney. Columns of water, caused by the diving headlong into the sea of these large goose-like birds, were conspicuous in the bright morning sunshine.

Frigate-birds were described clearly by M. Paul Bloc of Plum Farm, where they often heralded storms. M. Bloc was a keen and accurate observer, and knew the habits of birds well. He has spent considerable time on the water and at the Isle of Pines.

On Sunday, November 6th, a "bay excursion," attended by the white population at the sawmill of the *Nouvelle Compagnie*, provided a memorable day in the extensive lagoon south of the island. A few small islands were dotted about this fine sheet of water, and a landing was made on four of these. A feature of interest during the day was the presence of many companies, large and small, of gull-like Terns, or Sea-swallows, with long

Between Showers. M. Paul Bloc (right) and the author at Plum Farm, Southern New Caledonia. A pawpaw tree is alongside. The coconut grove rises behind the buildings.

Photo by Dr. Brooke Nicholls, R.A.O.U.

pointed wings and forked tail. Sometimes several species were mixed in a large company diving shallow for sardines or small fry swimming near the surface. As the birds took little notice of the steamer, many Terns were seen at close range.

The largest was the Crested Tern (*Sterna bergii*), named variously Swift Tern, Crested Tern, Bass Strait Tern, Torres Strait Tern, etc. As the "same name for the same bird" is a necessity for those desiring to know birds, Crested Tern it should be throughout its extensive range round the Indian Ocean and over a large portion of the Pacific Ocean, from the Hawaiian Islands to the Pacific Islands, and even casually to New Zealand. The black cap, white forehead, greyish-brown upper surface, white under surface and yellow bill were noticeable.

The graceful Roseate Tern is a widely distributed bird, from eastern America, Europe and Africa, even to Australia and New Caledonia. From the glistening white of the under surface at times, a reflection of the shallow sea water gave a beautiful green tinge, instead of the pink or roseate tint that gave the name Roseate Tern to the species *(S. dougalli)*. Sooty Terns *(S. fuscata)*, with black upper surface, and glistening white under surface and forehead, were also seen. We heard descriptions of scenes rivalling the famous "wide awake fair" of Ascension Islands, where Sooty Terns, the "egg-birds" of sailors, were breeding. We were told that, on many of the small islands of the New Caledonian lagoon, it was not possible to put a foot down without breaking eggs. After landing on four of these small islands, we realised that we were too early for this interesting sight.

A few dusky-black Noddy Terns *(Anous sp.?)* were in company with the other species. The Terns were just as keen on fishing as were the French mill folk, who caught 300 lb. weight of fish on hand lines trailing over the stern of the steamer.

The most interesting and most beautiful Tern was the White Tern *(Gygis alba)*, which, when diving in numbers in tropical sunshine, suggested a snow-storm with giant fluttering snowflakes. These Terns are found breeding on Ascension Island, west of Africa, the Seychelles Islands, east of Africa; and on Norfolk Island, east of Australia. The breeding habits are remarkable. No nest whatever is made, the one egg being balanced precariously in a knot-hole, or a depression of a living tree-trunk. The young one balances also precariously in this odd position. Probably the White Tern breeds near New Caledonia. As there was no authentic record of its occurrence in Australian waters, the name of this beautiful bird was not included in the second edition of *The Official Check-list of the Birds of Australia*. Terns of several other species were not definitely recognised. They are not scavengers as Gulls are, and often feed far from land. They were in sight throughout the voyage back to Australia.

The Silver Gull of Australia, New Zealand and New Caledonia was present in small numbers. The black wing-tips, with oval white patches, or "mirrors," the silver-grey and glistening white plumage, and coral red legs and bill, formed a pretty and familiar picture. The Silver Gull is indeed a handsome and dainty-looking bird. Some individuals had not the red bill, which in these appeared almost black; they had not the mottled wings of young birds. These Silver Gulls did not follow the steamer; but, feeding mainly on the tidal flats, acted as scavangers. Food is indeed abundant on these tropical shores, and yet Gulls are not numerous.

A soaring Skua. On the left is a piece of the rigging.

On the last morning at sea (November 20th), about 30 Arctic Skuas *(Stercorarius parasiticus)* followed the vessel almost into Sydney Harbour. These birds breed in the far north, and visit Australia and New Zealand during the northern winter. They flew over the stern, and held position as the steamer advanced. They offered fine views as they poised on soaring wings about 20 feet away. They showed at least two sets of plumage, that is, they were "dimorphic," a characteristic for which this species is famous. Some individuals had a dusky under-surface; others had a white collar, breast, and abdomen. Some had central tail feathers projecting at least three inches; in others these feathers projected much less, and in some birds they were not longer than the other tail feathers. The photograph by Dr. Nicholls apparently shows an even-tailed bird. Some birds seemed larger than others; possibly these were Pomarine Skuas *(Stercorarius pomarinus)*, which, breeding also in the far north and ranging to northern Australia, have been recorded from northern New South Wales. In view of the wonderful annual journey, the birds were observed with interest. As boys, we read of these bold sea-pirates. There were, however, no Seagulls, Gannets, or Terns close at hand on which to exercise their bullying, parasitical habits. They obtained their food with ease when scraps from the table were thrown overboard.

Seven species of the Plover tribe were listed for New Caledonia by Sarasin and Roux. Six of these wading birds breed in Siberia and the far north, leaving, as a southern breeder, the Beach Stone-Curlew *(Orthorhamphus magnirostris)*. This species ranges from the Andaman Islands to northern Australia, and, possibly as a casual visitor, to New Caledonia. Mr. Mathews did not list it east of New Guinea. Local sportsmen did not recognise the figure of it, and we did not meet it.

Sharp-tailed Sandpipers *(Erolia acuminata)*, the Grey Plover *(Squatarola squatarola)*, and the eastern Golden Plover *(Pluvialis dominicus)* were seen on three occasions at close range about a dwindling shallow pool of water near Bourail. Birds of the same three species were also recognised on a shingly beach east of Plum Farm. The cosmopolitan Turnstone *(Arenaria interpres)*, the widely ranging Whimbrel *(Numenius phaeopus)*, and the Wandering Tattler *(Tringa incana)*, all northern breeders, were also listed by Sarasin and Roux. Since our return to Melbourne, M. Bloc has sent me a specimen of the Whimbrel from the Isle of Pines. The curved beak was three inches in length. The eastern Curlew is larger, and has a long arched bill seven inches long.

The most famous bird of New Caledonia is the unique "Kagu," an aberrant, flightless Crane. This is rather a contradiction in terms, for Cranes are noteworthy as being amongst the best of fliers. The name Kagu is derived from the striking call "car-gou." This flightless, nocturnal bird was confined to an area in southern New Caledonia of "40 kilometres (25 miles) in diameter." There is a considerable demand from persons who keep birds in captivity for these interesting, easily domesticated birds. Six came on the *Dupleix*, to be sold in Sydney, and eight were taken to Australia without permission on the previous voyage. Kagus are at present in the Zoological Gardens of Sydney and Melbourne. Several were in captivity in Noumea. The trade in the birds would exterminate the species within a few years, but there is a worse enemy.

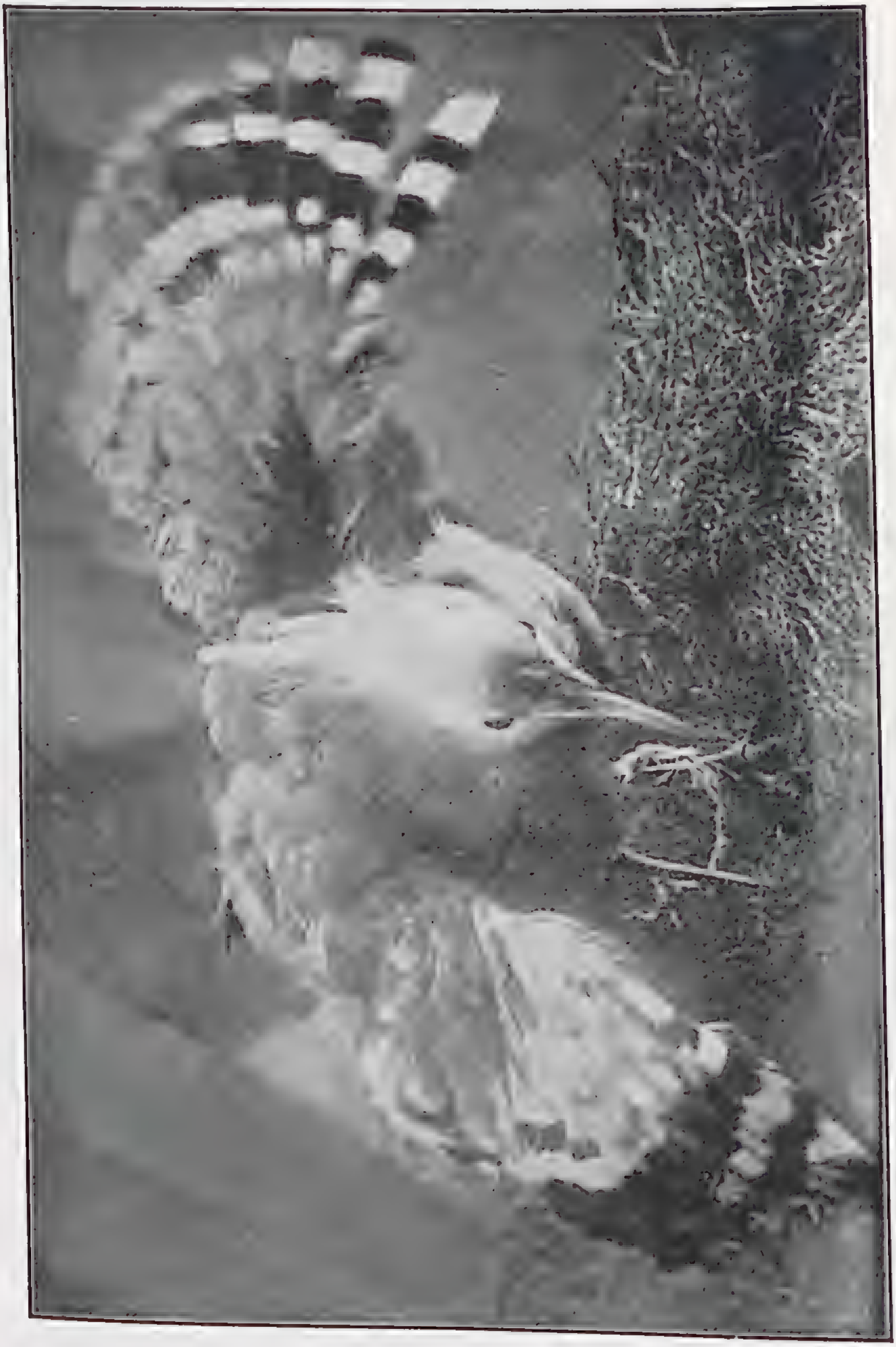
Every country resident keeps dogs to hunt deer. It was a surprise to hear of herds of 100 deer, the "worst pest" in an island where many pests flourish in the excellent climate and the rich fertile soils of many picturesque areas. However, venison is, as we found, a much appreciated article of diet. It is strange that the great success of the deer should imperil the very existence of the island wonder bird, the Kagu, whose figure, in remarkable display, formerly appeared on the postage stamps of New Caledonia.

Beagles were introduced to hunt the deer through the dense scrub until they took to water, where they stood at bay until shot. Cattle by the thousand, possibly 80,000, were responsible for one of the island's staple industries—meat-packing and canning. Australian cattle-dogs were introduced to assist on cattle-stations. These dogs interbred with the beagles, and the result was to be seen in the large number of liver-and-white mongrels observed everywhere. These dogs, searching for deer through the scrub, kill the defenceless and helpless Kagus.

One night was spent, for the purpose of making the acquaintance of this bird, in the logging camp at the railhead in the tropical forest, formerly a well-known haunt of Kagus. The birds, however, had gone. None had been seen or heard for some time, though the loggers examined the scrub closely in search of scattered kauri trees. Apparently, one of the world's famous birds is within measurable distance of extermination.

At a farewell interview, the opportunity was taken to express to His Excellency the Governor the desirability of taking the same action concerning the Kagu that had been taken in Australia concerning its wonder-bird—the Lyrebird *(Menura novæ-hollandiæ)*. His Excellency stated that he proposed to make regulations that would save the bird for New Caledonia, and for the human race. We wished him success. That action has now been taken.

Scientifically, this bird (*Rhinochetus jubatus*) is of extreme interest. It is generally accorded the rank of a family (*Rhinochetidae*), and is placed next to the two remarkable Sun-Bitterns (*Eurypyga*) of northern South America. In display, with peculiar markings on the short rounded wings, which were spread out and raised fanwise, it closely resembled the Sun-Bitterns, also remarkable in display. The peculiar *Mesites*, of Madagascar, has sometimes been placed with the Kagu and Sun-Bitterns, though it was placed by Mr. W. L. Sclater, in the *Systema Avium Ethiopicarum* (1924), with the fowl-like, scratching birds. These three archaic birds, isolated from modern birds, were grouped by Mathews and Iredale, in a *Manual of the Birds of Australia* (1921), in the sub-order, *Eurypygiformes.* In *Systema Avium Austra-*



The Remarkable Kagu—the Wonder-bird of New Caledonia—in Display.

lasianarum (1927), the Kagu is placed in the family with the typical Cranes (*Megalornithidae*). This surely is an error! It is still a subject of study and speculation. The plumage of the Kagu is of a delicate grey colour, and it has a long drooping crest; the feathers are loosely webbed. The fairly stout red bill is fowl-like, and it has peculiar rolled coverings over the nostrils, possibly to keep out earth while the bird is probing for food in loose soil; the red legs are fairly long. The three front toes are long, and the hind-toe is short and raised so that the feet resemble those of Cranes, Rails and Water hens, and not those of Herons. which have a comparatively long hind-toe on the same level as the other toes. The Kagu resembles a Night Heron in size and stand, but not in colour. Powder-down, as in the Australian Frogmouth (*Podargus*), Herons, White Cockatoos, and Wood-swallows is present. Evidently the Kagu is an ancient, generalised form confined to a continental island of great antiquity, possibly a fragment of the old southern continent, Gondwanaland, which included India, South Africa, and Brazil, as well as Australia. Certainly New Caledonia represents part of an ancient eastern extension of Australia. The haunts of the Kagu in the tropical brushes are being exploited as the valuable kauri pine trees are being felled. The new timber company expects that the kauri of their area will be cut out in ten years' time. It is certain that, with dogs, men, and falling timber, no Kagu will be left in that belt of country—its previous stronghold. In some of the rough mountainous areas, some birds may persist for a few years longer. Only one egg is laid, and only one young is raised each year. A bird on the s.s. *Dupleix* spread the wings, showed the characteristic rufous and white bars with black markings, and adopted the remarkable display attitude whenever it was alarmed.

Three of the five Heron-like birds listed by Sarasin and Roux were seen. The White-faced Heron (*Notophoyx novæ-hollandiæ)* was, as in Australia, the commonest of the three. It stood patiently fishing at many roadside pools, but did not permit a close approach. Indeed, it took alarm, and flew a considerable time before two grey ducks feeding in close proximity to it showed concern. Possibly, this indicates that the heron is sometimes shot at; doubtless, it is eaten in a country where many articles serve for food. These Herons rowed themselves along steadily, and were frequently seen in flight. They sought food on beaches, as well as from inland pools. The White-faced Heron is found throughout Australia, Tasmania, New Caledonia, and New Zealand.

On Tareti Island—an island in the making—consisting of loose, very coarse fragments of corals and shells, and practically devoid of vegetation, a pair of Reef-herons (*Demi-*

gretta sacra) was seen at close range. One bird had snow-white plumage, and the mate was a slaty grey. The two birds rose in company, and, after being disturbed the second time, departed by themselves for another island. In New Zealand the grey bird only has been recorded, though it is so rare there that no argument can be based on the possible absence of the white form. Apparently the grey and white birds are dimorphic forms of the one species. They have been recorded as breeding together on the Victorian coast, as well as on the Queensland coast. No parti-coloured bird has been recorded. Some ornithologists regard these birds as belonging to two species. Reef-herons are found on coasts from Japan and Burma to Australia, and the Pacific Islands to New Zealand. Mr. Mathews did not include New Caledonia in the range of this species.

At a store near Bourail many birds were kept in captivity. These included a Nankeen Night Heron in good adult plumage, except that the long, narrow, white plumes from the nape were absent. The bird was not seen in the field, and was not well known to local residents, possibly on account of its skulking, nocturnal habits. The Australian and New Caledonian species was first named *caledonicus* by Gmelin, from New Caledonia, where it was first seen by Captain Cook's expedition. Birds of this species are found from Celebes, Timor and New Guinea to the Pelew Islands, Australia, Tasmania, New Caledonia and Lord Howe Island. It has been recorded casually from New Zealand.

The green or green-backed Heron of American lists has been considered identical with the Mangrove-Heron of Australian lists. It occurs from South America across the islands of the Pacific Ocean to Australia, India and Africa, reaching even to Japan. In the latest list, Mr. Mathews used the name *Butorides javanica*, and gives the range as from Tahiti to Java. He evidently now considers the Australian and Pacific form distinct from the American species (*B. striata*).

The large brown Bittern (*Botaurus poiciloptilus*), with brown and creamy-buff plumage, is an adept at hiding in reed-beds, so that we hardly expected to see it. Its booming note, responsible for the name bull-bird, is apparently as well known in New Caledonia as in Australia, Tasmania, and New Zealand. Sarasin and Roux recorded the brown Bittern from New Caledonia, though Mr. Mathews did not include New Caledonia in its range. M. Bloc, of Plum Farm, knew the bird well.

It was a pleasant sight on a picturesque reach of the La Foa River to see two Grey Ducks (*Anas superciliosa*)—the Australian Mallard—feeding quietly while up-ended. Apparently, the Grey or Black Duck is the principal sporting bird of New Caledonia, as it is of Australia; it occurs in large numbers at certain times of the year. Birds of this species have an exceedingly wide range from Celebes and Java on the west to the Pelew Islands north of the equator, to Tasmania and New Zealand on the south, and to Tahiti on the east. It is *the* Duck of the Pacific, which is poor in species of Duck-like birds. Although similar in structure to the European Mallard, it differs much in colour, the male closely resembling the female, and having no bright colours and no "eclipse plumage" as has the European Drake. The other four Ducks listed by Sarasin and Roux occur also in Australia. These are the Whistling or Wandering Tree-Duck (*Dendrocygna arcuata*), found from the Philippine Islands and Java to Oceania; the Grey Teal *(Nettion gibberifrons)*, from Celebes to New Caledonia and New Zealand; the diving Hard-head or White-eyed Duck (*Nyroca australis*), of New Guinea, Australia, Tasmania, New Caledonia, and New Zealand; and the Blue-winged Shoveler (*Spatula rhynchotis*) of Australia, Tasmania, New Caledonia, New Zealand, and Auckland and Chatham Islands. Local sportsmen took little notice of illustrations of these birds, whereas illustrations of the Grey Duck always excited interest and comment. Strange to say, Mr. Mathews, in *Systema Avium Australasianarum*, Part I. (1927), did not include New Caledonia in the range of any member of the Duck-tribe.

Six species of the large and cosmopolitan group of diurnal birds of prey (*Raptores*), "seizing birds"—are listed for New Caledonia. Five of these are on the Australian list, while the sixth (*Astur haplochrous*) is restricted to New Caledonia. This Goshawk is a remarkable bird, dark grey in colour, with a conspicuous yellow bill and glistening white lower breast and abdomen. We were fortunate, while travelling through magnificent scenery on a well graded motor road over the mountains, near Bourail, to see and hear for some minutes a male bird in fine plumage, as he sat calling and scolding from a bare tree-top. His larger and less conspicuous mate was sitting close by on a log. Our driver excitedly told us of the chicken-stealer; so it was evident that the bird, in common with other Hawks, bore a bad name with country people. When we were in the south of the island, a large female watched us closely as we observed her for some time.

The "Australian Goshawk" (*Astur fasciatus*) was seen on two occasions. A dead specimen was shown us at the camp of some bridge-builders to the north of Bourail. Apparently, the Goshawk had ventured close to the domestic poultry, and had paid the price.

When travelling over the upland, swampy plain crossed by the railway from the sawmill, we received a good description of the white-rumped Swamp-Harrier (*Circus approximans*), which is found in Australia, Tasmania, Lord Howe Island.

Norfolk Island, New Caledonia, Fiji and New Zealand. Some authorities consider this bird a sub-species of the Marsh-Harrier of Europe. Later these birds were seen patrolling the lower part of the Riviere de Pirogues, as they searched for an evening meal on two successive days.

The commonest large Hawk was the so-called Whistling Eagle (*Haliastur sphenurus*, 1818). The melodious whistling call, which was responsible for the name *canorus* applied to this species by Vigors and Horsfield in 1827, was often heard, and was generally the prelude to a good exhibition of flying, as the bird, on boomerang-shaped wings, circled nobly upwards. This species is found in Australia and New Caledonia. As well as acting as a scavenger along the coast, it seeks food inland.

The almost cosmopolitan Peregrine Falcon (*Falco peregrinus*) was observed flying up-stream as we crossed the bar at the mouth of the Riviere de Pirogues. Named as a dozen distinct species from different countries, this cosmopolitan bird was the species favoured by the knights of old in the days of falconry. It was listed for New Caledonia by Sarasin and Roux, though Mr. Mathews did not list any Falcon for the island.

Two fine specimens of the practically cosmopolitan Osprey or Fish-hawk (*Pandion leucocephalus*) circled over the famous "perched rock" at Bourail, and another pair had a large nest on small Alter Island, the fourth of the islands on which we landed on November 6th. This nest was built on a leaning *Casuarina* tree at the height of about 25 feet. The nest had been added to year by year, so that Mr. Ross, the energetic manager of the sawmill, had considerable difficulty in surmounting the rim of the nest to see that there was neither egg nor young in it. The birds were soaring overhead, while under the edge of an adjacent bush was a pretty black and white banded Water-snake (*Hydrophris*), which, though sluggish on land, is a highly venomous reptile. We saw skeletons, but no live snakes on Mast Head Island. Here we saw many live snakes, and no skeletons. The White-breasted Sea-eagle nested on Mast Head Island, but is absent from New Caledonia. It would be well to introduce these fine birds to keep the deadly Sea-snakes in check. We killed four on the short beach where we landed to lunch on Redika Island.

The only Owl recorded from New Caledonia is the very widely distributed, almost cosmopolitan Barn-owl (*Tyto alba*), the Barn or White Owl of the British Isles. It was not seen by us, but residents at once recognised the figure. It was listed by Sarasin and Roux and by Mr. Mathews.

As in other countries, Parrots are general favourites as cage-birds. At La Foa, and many other places, Lorikeets—

Brush-tongued Parrots—were very numerous on the flowering coral-trees (*Erythrina*), conspicuous with bright red or orange flowers. The common Parrot was *Trichoglossus hæmatodus*, ranging from New Guinea to New Caledonia. It is the local representative of the closely similar Australian Rainbow or Blue-bellied Lorikeet (*T. novae-hollandiae*). The abdomen of the Australian bird is blue, but that of the New Caledonian birds is green. These Brush-tongued Lorikeets—screeching much, as they flew swiftly and directly—obtained nectar from the numerous flowering trees and shrubs. In cages in different parts of the island these gaudy Green-bellied Lorikeets were seen. Several interested residents considered a coloured drawing of the Australian Musk-Lorikeet (*Glossopsitta concinna*) represented a New Caledonian bird, which, however, we did not see. It was listed as *G. diadema* by Mr. Mathews, and also by Sarasin and Roux.

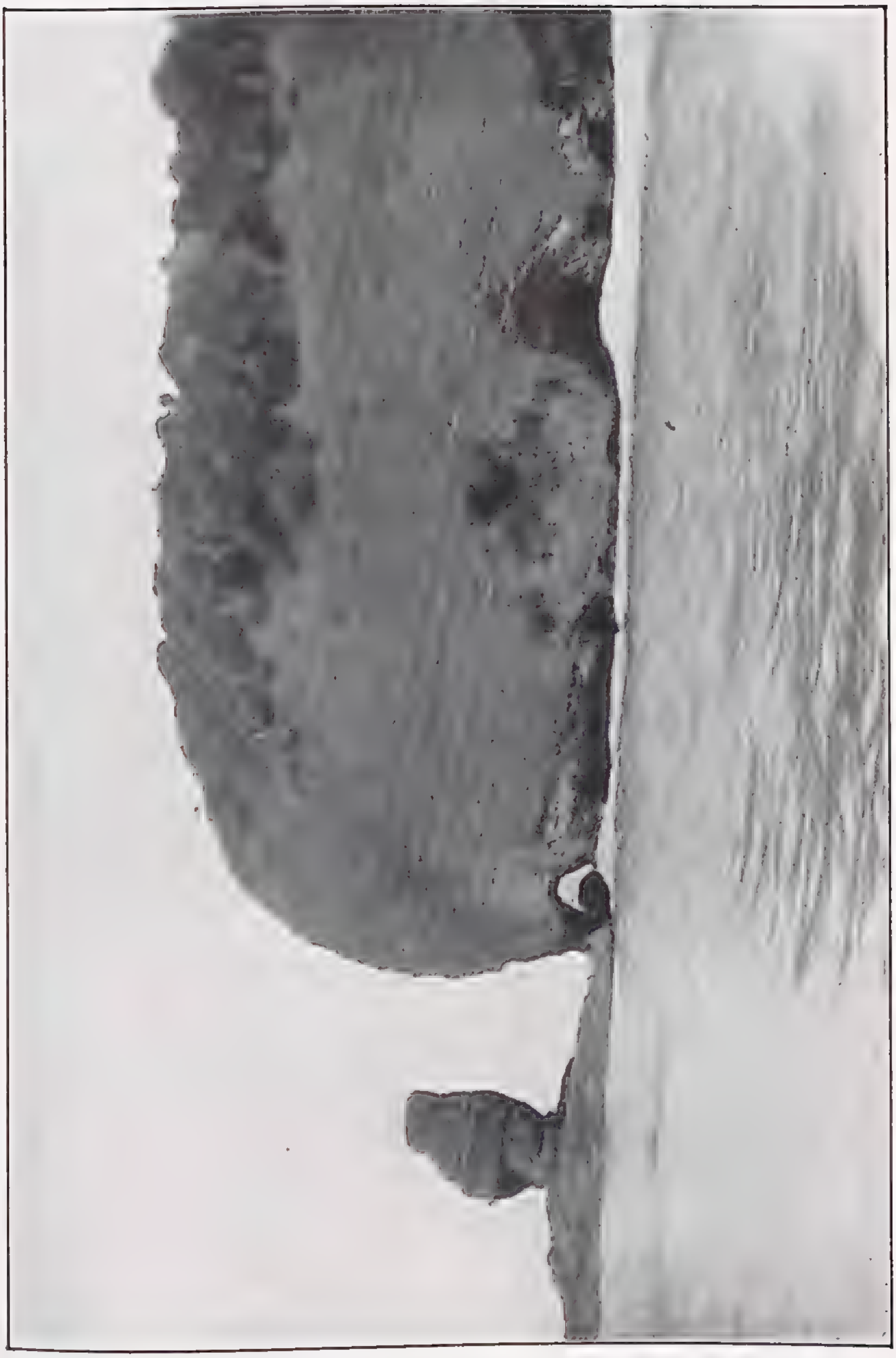
When leaving Australia we had hoped to see and hear in nature the beautiful, crested or horned Parrot, *Nymphicus cornutus*, which had "a pretty warble." One specimen only was seen, and that was in a large cage, where it had lived for twenty years. It was a striking bird, with polished black horny beak, a dark green crest of two narrow long feathers, with crimson on the head on each side of them, a green back and blue wings. The only close relative of this remarkable Parrot is the Uvea Parrot, from Uvea, one of the Loyalty Islands, which are adjacent to New Caledonia. Possibly this crested bird is related, though distantly, to the Cockatiel or Cockatoo-Parrot of Australia, which also has an immovable crest unlike that of a Cockatoo. Mr. Mathews, in the *Systema Avium Australasianarum,* classed this New Caledonian Parrot with the Rosellas and Grass-Parrots in the group of Broad-tailed Parrots.

The New Caledonian representative of a group of Parrots confined to the islands of the central Pacific Ocean and classified in the genus *Cyanorhamphus* was not seen. Two species of these Parrots are found in New Zealand, one of them *(C. novæ-zelandiæ)* ranging even to the Antipodes Islands, Macquarie Island and Auckland Island on the south, to Norfolk Island, Lord Howe Island and New Caledonia on the north, and to Tahiti on the east. It is related to the Rosellas of Australia, being included in the same subfamily, the Broad-tailed Parrots (*Platycercinæ*).

The illustration of the Owlet-nightjar (*Ægotheles cristatus*) provoked from several local residents the name "chouette" and the imitation of the note as "kar.". We did not expect to see this small nocturnal bird which lives in hollow trees It was listed by Sarasin and Roux and also by Mr. Mathews as *Æ. savesi.*

Undoubtedly, the commonest and most conspicuous bird of the roadside was the Sacred Kingfisher (*Halcyon sanctus*), the same bird with the same note as in Australia. These birds frequently sat on telephone wires, and uttered their oft-repeated "pee, pee, pee." They were known to all as "martin pecheur," and showed considerable variation; some were, on the upper surface, a green or a bluish green; others were a blue or a greenish blue. Some were a deep buff, and some were white on the under surface. The Sacred Kingfisher ranges from Celebes and the Moluccas, New Guinea and the Bismarck Archipelago, Australia, New Caledonia, and Norfolk Island to New Zealand and the Kermadec Islands. Our chauffeur and friend in need, and in deed, Monsieur A. Roger, who spoke English creditably, after our northern trip informed us, while driving us from the southern excursion, that he had seen a new Kingfisher of the same size; but of a dusky greenish colour on the head and back and with white collar and under surface. This suggested the Mangrove Kingfisher (*Halcyon chloris*). As that bird is found from the Red Sea to Fiji, including northern Australia and Queensland, it probably awaits definite record for New Caledonia.

Swifts in southern Australia are not likely to be confused with Swallows, so common about houses. In New Caledonia, however, the common birds about the houses were small Swifts. These abundant birds were seen almost anywhere; they proved to be the White-rumped Swiftlets of New Caledonia, Loyalty Islands, and the New Hebrides. These small, dusky black Swiftlets had a distinct white band across the rump; this is reflected in the scientific names, *Collocalia leucopygia* (white, rump) and *C. uropygialis* (tail, rump). Both have the white band. In the basement of a hotel at Paita, a small colony of about eight pairs of White-rumped Swiftlets was found. The tiny, pouch-like nests were cemented on to the sides of the flooring joists. They were made of the bark of the niaouli (nee-ow′-lee) tree, the abundant paper bark (*Melaleuca*) trees characteristic of every open space. One nest contained a fully fledged young bird; another contained two white eggs; and two others, one egg each. The very small nest would with difficulty hold two young birds. The gluey material responsible for the name, *Collocalia* (glue, nest), held the nest very firmly to the beam, so that it was detached only after considerable effort. The fully fledged young bird hooked its claws into the material of the bark nest and clung very tightly. After being photographed clinging on the side of an ornamental tree, it was soon returned to the nest. On our return journey, four days later, the young bird was again placed clinging vertically on the tree; but, before the camera was used, it flew over 200 feet and settled on the side of a branch. Again it flew, and was lost to sight.



The Perched Rock, a famous coast feature near Bourail. White-rumped Swiftlet nested near the roof of the arch. The cave at the beach also continues through the bold headland.

Photo by the Author.

The white band on the rump of this nestling was as plainly seen as that of the adults. Under most bridges and culverts along the remarkably good motor roads, the birds flew in and out. They probably breed there, as Welcome Swallows (*Hirundo neoxena*) and Fairy Martins (*Hylochelidon ariel*) do in Australia. Near the famous "perched rock" (see illustration) on the coast near Bourail, we found a group of about 20 nests adhering to the walls and roof near the northern entrance to the cave. The birds flew in and out from the nests while a photograph was being taken. At Plum Farm a nest was being built on the side of the ridge-pole in a fowl-house. These white-rumped swiftlets are as common and as tame in New Caledonia as the Welcome Swallow is in Australia.

Flying with the White-rumped Swiftlets was a larger dark-plumaged bird which was much less numerous. They hawked for insects, even about the Hotel de la Gare, at Noumea. This was probably the bird listed by Sarasin and Roux as *C. fuciphaga typica.* The Uniform Swiftlet (*C. fuciphaga*) is a stationary bird, spread widely from Central China, Northern India, Ceylon, the Seychelles Islands, the Philippines to New Guinea, North Queensland, New Caledonia, and New Hebrides.

Sarasin and Roux listed four species of Swifts from New Caledonia, the three named above and *C. agnota*, which Mr. Mathews considers a synonym of *C. leucopygia,* an earlier name given to the same species.

The remarkable nest of *Collocalia fuciphaga* (Fucus, eater), was formerly thought to be made of macerated seaweed (*Fucus*); but no seaweed is used, the nest being composed of hardened saliva, with often little admixture of other materials. The nests of the edible-nest Swiftlet, *C. esculenta*, which ranges from Borneo, Celebes, and Java to New Guinea and the Solomon Islands, are much sought after. A considerable trade in these "edible birds' nests" is carried on with China, where the nests are used to make soup, which is said to be of value for health reasons.

In a cave in a limestone hillside, several kilometres from Bourail, we were, in the late afternoon, to our surprise, caught in a whirling, twisting mass of Swiftlets pouring into the cave at the same time as a rush of departing Bats was leaving it. Possibly, a search of this cave, close to a native kanaka village, would reveal nests similar to the famous edible birds' nests of commerce.

The nests of these small Swiftlets show a gradation in the use of the saliva; that of *C. leucopygia*, the white-rumped Swiftlet, in which the saliva was used only to cement the bark to the support; that of the Uniform Swiftlet, *C. fuciphaga*, with little admixture of foreign material, and that of the edible-nest Swiftlet, *C. esculenta,* with no foreign material.

The Swallow, *Hirundo tahitica*, widely spread from the Solomons, New Britain and New Caledonia to Fiji and the Friendly Islands, and listed by Sarasin and Roux, was not recognised by us.

Of the three Cuckoos listed by Sarasin and Roux for New Caledonia, two were heard frequently. The Long-tailed Cuckoo (*Urodynamis taitensis*) did not come under notice; possibly the period of our visit was its time for occupying the more southern parts of its range, which includes New Caledonia, Norfolk Island, Lord Howe Island and New Zealand. It breeds in the colder part of its range, as all migratory birds do.

A Bronze-Cuckoo was common everywhere we went. The characteristic note closely resembled that of an Australian Bronze Cuckoo, as well as the mewing of a kitten; it was often heard. Sarasin and Roux considered the island form identical with the Golden Bronze-Cuckoo (*Lamprococcyx plagosus*), well known in Australia, Tasmania, and the Pacific Islands. We thought it possible that the Shining Bronze-Cuckoo (*L. lucidus*) of eastern Australia and New Zealand might be found on this natural stepping stone from New Guinea and North Queensland to New Zealand. Mr. Mathews listed the New Caledonian Bronze-Cuckoo as a distinct species (*L. layardi*). The New Caledonian bird with bronze green back and an under surface barred with bronze brown and white was conspicuous and beautiful. It has the parasitic habits of the Cuckoo of Europe, depositing the eggs in the nests of other birds, and leaving the foster parents to rear the young Cuckoos.

At La Foa, a holiday party of French residents from Noumea indulged in shooting birds, though this pastime is generally supposed to characterise an Englishman. They proudly displayed many Lorikeets, Friar-birds, and other honey-eating birds shot in the flowering coral-trees. They also killed a Cuckoo, from which the tail had been shot away. This was the Fan-tailed Cuckoo, though the under-surface seemed to be a richer buff. Undoubtedly, this bird was the *Cacomantis bronzinus* of Sarasin and Roux, and the *C. prionurus bronzinus* of Mr. Mathews, a sub-species of the widely spread species, *C. prionurus* or *C. flabelliformis*, the Fan-tailed Cuckoo, ranging throughout Australia except the north-west, Tasmania, the Aru Islands, New Guinea, Solomon Islands, New Caledonia, New Hebrides, and Fiji. This Cuckoo has the family habit of leaving its eggs in other birds' nests.

The Grey Fantail (*Rhipidura flabellifera*) was as friendly and tame as in Australia, where it dwells in city gardens, such as the Fitzroy Gardens in Melbourne. Mr. Mathews has drawn attention to the close affinities of many so-called species of these widely spread Fantails from Western Australia to New Zealand, where Captain Cook's party first met the bird originally named *Muscicapa flabellifera*, by Gmelin, in 1789. This variable species of Fantail was named as several different species in Australia; now all are considered to be the one species, though several geographical races or sub-species have been named trinomially by Mr. Mathews. The New Caledonian bird closely resembles the Victorian bird in form, size, markings, habits and song. Several nests were observed at the building stage. The characteristic wine-glass nest, with long stem, but with no foot, was a facsimile of an Australian nest. The peculiar song of a remarkable light penetrating quality was often heard. These birds showed no fear of man or beast, and even ventured into a diningroom in pursuit of flies. Sarasin and Roux listed for New Caledonia two species of Fantails, *R. verreauxi* and *R. bulgeri*. It is possible that we saw members of only one of these species; it is probable, however, that, as this is a highly variable bird, the two will prove to be but forms of the widely-spread New Zealand and Australian species which has been listed for New Caledonia and the New Hebrides.

The female of the New Caledonian Flycatcher, listed as *Myiagra caledonica* by Sarasin and Roux, is a striking bird, with rust-red throat. It is the favourite "rouge gorge" (red throat) which seems to replace, in the affections of local residents, the Robin Redbreast of other countries. With a neat grey back, a narrow white eyelid, and striking rust-red or "orange-rufous" cheeks, throat and upper breast, it is a conspicuous bird. In company with its mate, it may come about a house or even enter a room to catch flies, which, however, are not nearly so numerous in New Caledonia as in Australia. The grinding, rattle-like note of this Flycatcher was often heard. The male is black-throated, and the female, as in the Leaden Flycatcher (*M. rubecula*) of New Guinea, Australia and Tasmania and the Satin Flycatcher (*M. cyanoleuca*), of Louisiade Archipelago, Papuan Islands, eastern Australia and Tasmania, is red-throated.

Amongst Australian "song-birds," Whistlers or Thickheads stand high. Just as conspicuous and harmonious in New Caledonia was a rufous-breasted bird which seemed indistinguishable in the field from the Rufous Whistler widely spread throughout Australia. Note for note, through a big variety, it agreed in song with the Australian bird. Possibly, the New Caledonian bird listed as *Pachycephala xantherythraea* might well rank as a sub-species of the Australian Rufous Whistler (*P. rufiventris*). Sarasin and Roux listed two other species of *Pachycephala*, *P. caledonica* and *P. morariensis*. In *The Handlist of Birds*, Dr. Bowdler Sharpe gave *P. morariensis* as a synonym of *P. caledonica*, which seems the representative of the Australian Golden-breasted Whistler (*P. pectoralis*). We did not see a Yellow-breasted Whistler in New Caledonia.

Amongst favourite Australian birds are the trustful and dainty Yellow Robins (*Eopsaltria*). Just as friendly and dainty is the New Caledonian Yellow Robin (*E. flaviventris*). It is somewhat smaller than the southern Yellow Robin of eastern Australia (*E. australis*). The patch of yellow occupies the abdomen, the breast being grey. This bird perched sideways on a sapling, and had other habits of its Australian relative.

With the Whistlers and Yellow Robin, a bird with dark plumage seemed to rank. Probably this is the bird listed by Sarasin and Roux as *Clytorhynchus pachycephaloides.* It was not common, though a glimpse was gained in different places. The loose decomposed plumage of the back possibly caused its association with a genus of birds confined to Madagascar, and Mr. A. H. Evans, in the Cambridge Natural History, Birds, to place it between the Australian Magpies and the Whistlers in the sub-family, *Malaconotidae* ("soft, back"). Field characteristics suggested the relationship to Whistler expressed in the specific name, *pachycephaloides* (*oides* form). *Eopsaltria* and *Pachyceplala* are now considered to be related to Flycatchers (*Muscicapidae*), and not to Shrikes (*Laniidae*).

The Graucalus or Cuckoo-shrike of New Caledonia (*Coracina caledonica*) somewhat resembles in style the Black-faced Cuckoo-shrike (*C. novæ-hollandiæ*), ranging from Celebes to Australia and Tasmania. It is about the same size, from 13 to 14 inches in length from the tip of the bill to the tip of the tail; but is of a nearly uniform sooty black, with the under tail coverts edged with light buff; the iris is a light yellow, and the heavy black bill is notched. This bird has a whistling note, responsible for the local name "sifflеur" (whistler), not related, however, to the "whistlers" already mentioned. This bird, though uncommon, came occasionally into the garden at Plum Farm, where it was considered a valuable destroyer of destructive insects.

A bird of fine song resembled the White-winged Triller or White-shouldered Caterpillar-eater (*Lalage tricolor*) of Australia and New Guinea. It was widely spread on the island, and was just as melodious in New Caledonia as its relative is in Australia. This is probably the bird listed as *Diaphoropterus naevius* by Sarasin and Roux. The genus *Diaphoropterus* is placed next to the genus *Lalage* in *The Handlist of Birds.* This bird took a noteworthy part in the morning chorus of song at the sawmill on the Riviere de Pirogues (River of Canoes).

The bird listed by Sarasin and Roux as *Edoliisoma anale*, the representative of the Jardine Caterpillar-eater or Cicada-bird (*E. tenuirostre*) of northern and eastern Australia was not seen by us.

In some shady trees near the mouth of the Plum River was seen the New Caledonian Blackbird (*Merula xanthopus*). It is strange that the genus *Merula*, containing the European Blackbird should be represented in these Pacific Islands, and not in Australia. The New Caledonian bird seemed plumper and also shorter in the tail than the British species, which has been introduced into Australia, where Blackbirds flourish in many cities. They have spread already in places for some distance into the country.

Our first bird-call came with the first daybreak, and was the characteristic, melodious song of a *Gerygone*, a bird formerly called a flyeater, but now called a warbler in Australia. A look from the bedroom window showed on the high cliff-face, a few feet away, a pair of very small birds much resembling the Western Warbler (*G. fusca*), which ranges from south-western Australia to southern Queensland and northern Victoria. The song suggested that of the White-throated Warbler (*G. olivacea*) of northern and eastern Australia. The birds under notice differed from that bird in the absence of bright yellow from the grey under surface. The musical song accompanied us as we moved about the island, where the bird was common. A tourist considered the remarkably loud and melodious notes of the little bird mimicked the gramophone well. Sarasin and Roux listed two species, *G. flaviventris* and *G. rouxi*. As no specimen was handled, no opinion on the specific identity of the bird seen can be offered.

Sarasin and Roux listed a bird as *Megalurulus mariei*. In *The Handlist of Birds*, this species is placed in the family *Timeliidae*, intermediate in position between Australian Scrub-robins (*Drymodes*) and Australian Babblers (*Pomatostomus*). We met this bird in scrubby places near the saw-mill.

One species of Wood-swallow was common in places. This bird was closely related to the White-breasted or White-rumped Wood-swallow (*Artamus leucorhynchus*) ("white, bill") that ranges so widely, occurring from the Andaman Islands to the Philippines, the Malay Archipelago, New Guinea, and Australia. It is found also in New Caledonia and the New Hebrides. Sarasin and Roux gave the name as *A. melanoleucus* ("black, white"). The bird seen was a typical *Artamus*, and was fond of sitting high on a dead branch near a tree-top or on a telephone wire, meanwhile swinging the tail sideways. At intervals, it flew to snap up an insect and returned to its perch. It took little notice of us. At

Plum Farm it has gained a reputation as an eater of hive-bees, such as the dusky Wood-swallow (*A. cyanopterus*) has in Australia. Close observers, however, claim that it eats bee-moths in preference to bees, and hence is a "friend" of the apiarist.

The numerous colonising, sociable silver-eyes were everywhere, and the pleasant soft chorus of song was ever with us. Sarasin and Roux listed two species, *Zosterops lateralis* of eastern Australia and *Z. xanthochroa* confined to New Caledonia. The common bird had a wider girdle of white around the eye, was yellow on the chest and under the base of the tail, was greener on the back, and appeared larger than the Victorian birds.

Honeyeaters were numerous and conspicuous birds in the many flowering trees and shrubs. The large coral-trees with blossoms of flaming red or orange and the large wide-spreading flamboyant trees with sheets of crimson flowers were alive with active, noisy Lorikeets and Honeyeaters. The last mentioned tree has been so extensively planted in all places visited that it might well be considered indigenous.

Of the five observed species of the family of Honeyeaters (*Meliphagidae*), one was very small, one was small, one was of fair size, and two were larger. The smallest Honeyeater belonged to the genus *Myzomela*. The Scarlet Honeyeater (*M. sanguineolenta*), of eastern Australia, with scarlet head and chest, is not more gaudily attired than the closely similar *M. caledonica*. It was not common, but was widely spread, and was seen both to the north of Noumea and to the south in the tropical brushes.

Just as the Black Honeyeater (*M. nigra*) of the interior of Australia has no bright colours, so a sombre dark green Honeyeater was in striking contrast to the Scarlet Honeyeater. Its calls and song, too, were persistent, loud, and often heard. It was a tame little bird, common even in the ornamental trees in the grounds of the Hotel de la Gare, at Noumea. It was a surprise when the loud ringing notes were traced to this small dark-coloured bird, whose identity was not fixed.

A dark bird about the size of a house sparrow was also musical, and was mainly responsible for the remarkable after-sunset chorus on the flats near the Riviere de Pirogues at the sawmill. Almost before sunset one felt inclined to light the lamp indoors; by 6.15 darkness was approaching, and the bird chorus was in full blast; by 6.35, it was almost dark, and the notes were becoming isolated; by 6.40, but one or two belated notes sounded; by 6.45, it was night, and all was silent. These lively little birds certainly created the unusual feature of an evening bird chorus, not paralleled elsewhere in my experience as an observer of birds. These birds had no distinct markings to vary the dark plumage, though a lighter mark on the gape and a single row of smaller, scaly feathers of somewhat lighter colour at the ear seemed to remind one of that plain-coloured but melodious songster, the Brown Honeyeater, formerly called *Stigmatops ocularis*, but now listed as *Gliciphila (Lichmera) indistincta*, and widely spread in Australia. It was even more noisy than that musical bird, and used a variety of attractive ringing notes and calls. One call suggested the persistent tinkling of the Bell-miner (*Manorina melanophrys*) of South Queensland, New South Wales and Victoria, mainly in coastal districts and fern-gullies. Possibly this musician is the bird listed as *Gliciphila incana.*

A larger Honeyeater, with striped breast, barred sides, spotted head and nape, and the markings usual to a typical *Gliciphila*, was probably the bird listed as *G. undulata* of Sarasin and Roux. One bird observed a spider on the down pipe from the spouting of the verandah. The spider actively circled the pipe. The bird followed, and came within three feet of where I was sitting. When it saw me it perched on the verandah rail quite close to me. Pairs of these birds, very noisy and active, came frequently to the flowering shrubs in the garden both at the sawmill and at Plum Farm.

The Friar-bird (*Philemon lessoni*), of New Caledonia and Lifou, one of the adjacent Loyalty Islands, is as noisy as is the "Noisy Friar-bird" (*P. corniculatus*) of eastern Australia. This species was common in the forest, where it was sometimes shot by the loggers. Along the La Foa River, in the flowering coral-trees, it was numerous. "Was" is used advisedly, for a party of amateur "sportsmen" from Noumea spent the holiday of All Saints' Day in the reputedly English fashion of "it's a fine day, let us kill something." Accordingly, Friar-birds and Lorikeets suffered. The head of this New Caledonian Friar-bird is not naked, but is feathered, as is that of the little or Yellow-throated Friar-bird (*P. citreogularis*) of northern, eastern and South Australia. The lighter markings on the wings brightened the otherwise dark-brown plumage. The star-like feathers, conspicuous on the breast of the larger Australian Friar-birds, were also noticeable, though not conspicuous, in this bird. A large unfledged young one that had fallen from the nest at La Foa was shown to us by our host, M. Benezuelos, a very keen sportsman, who knew the local birds by their local names.

Another Honeyeater listed by Sarasin and Roux as *Leptomyza aubryana* was not recognised by us.

The Parrot-finch (*Erythrura psittacea*) proved rare. There is a considerable demand amongst lovers of caged birds for these pretty Weaver-finches. They were observed on two occasions, and then but a small number of them was seen some miles north of Bourail, where a bridge over a considerable river was being built. They were beautiful little birds, and active in their movements, as they flitted about amongst the grasses in search of seeds. Locally, this bird is called the "Cardinal," a name probably borrowed from the famous and beautiful Cardinals of America. The New Caledonian Cardinal is much smaller, has a red face, red throat, red chest, red tail, and green body. (See *The Emu*, plate II., volume 25.)

Small Grey Finches (*Estrilda estrilda*) with red bill were, though natives of Africa, called "Bengali." Dealers used the name Bengali, and to this day, though based on error, it is applied to these introduced African birds. These small birds were very numerous in New Caledonia, where they fed amongst the long grasses on the roadsides.

That practically cosmopolitan pest, the House Sparrow (*Passer domesticus*) was common in New Caledonia, where it had been introduced.

The most conspicuous of the three introduced birds was the "Merle de Mσllucque," the Common Myna of Afghanistan and India, introduced to New Caledonia as it was to Australia. It is not native to the Moluccas. In Australia this bold bird is almost confined to the towns, but in New Caledonia it inhabits mainly the country districts. Though omnivorous, it is, in pastoral districts, largely insectivorous. In fruit and vegetable gardens, however, it was less highly esteemed. It more often flies in company in New Caledonia than in Australia. The "recognition patches" of white in the wings are then conspicuous, and a flock in flight presents a picturesque sight, though less beautiful than a flight of Galahs or Rose-breasted Cockatoos.

The Shining Starling of New Caledonia (*Aplonis caledonica*), closely resembling its relative which ranges from Celebes to north Queensland, was seen on two occasions, so that it was not common. It is a brilliant, black bird, resembling in size the common Starling introduced into Australia.

The large black Corbeau (*Physocorax moneduloides*), a member of the practically cosmopolitan Crow and Raven family, was common and noisy with a variety of calls and notes. It is confined to New Caledonia. It works in small companies, as does its distant relative—the White-winged Chough, of eastern and southern Australia. The Chough is a member of the Crow family, and, because of working usually in small flocks, is sometimes called the Apostle-bird. The name Corbeau is the French for Crow.

A Visit to Mutton Bird Rookery, Cape Woolamai, Phillip Island

By D. DICKISON, Hon. General Secretary R.A.O.U.,
170 Latrobe Street, Melbourne.

Since the destruction of the native vegetation by fire and cattle on Cape Woolamai a serious menace to the Mutton-bird rookery has been caused by the drifting sand which is blown by westerly gales over a large area of the Cape. It was for the purpose of making this fact better known that the Chief Inspector of Fisheries and Game issued invitations to three scientific societies in Melbourne to appoint two delegates to accompany him on a visit of inspection to the Mutton-bird rookery on November 26th, 1927. The following delegates were appointed by their respective societies:—Messrs. A. G. Campbell and D. Dickison (R.A.O.U.), N. A. R. Arnold (Bird Observers' Club), E. E. Pescott and C. L. Barrett (Field Naturalists' Club), while Mr. W. F. Gates joined the party on invitation from the Chief Inspector (Mr. F. Lewis).

On arriving at Cowes the party was met by Mr. Lewis, who first conducted the party to the smaller rookeries along the south coast of the Island. The first rookery inspected was at Dixon's, where a few birds were still breeding under adverse conditions, but, owing to the rapid encroachment on the few remaining burrows by the sand, it is likely that the Mutton-birds will be unable to breed here much longer. The rookeries at Fletcher's and at Forest Caves were next visited, and similar evidence of the destruction of the burrows by the sand was apparent. All these rookeries, being on private property, have been denuded of their native vegetation by fire and cattle, and, consequently, the sand has become loose by incessant exposure to the winds. In a small Government Reserve of eighteen acres, where marram grass has been planted to arrest the sand-drifts, it was found that Mutton-birds were still breeding freely, and, unlike the other rookeries, their burrows were escaping being smothered by the sand.

On reaching Newhaven the party was conveyed by boat to Cape Woolamai, where tents had already been erected by officers of Mr. Lewis' Department. Two other ornithologists in Messrs. A. H. E. Mattingley and McCall had just arrived, and later in the afternoon over thirty members of the Workers' Educational Association arrived under the leadership of Mr. H. N. Beck.

The arrival of the Mutton-birds at dusk provided an interesting sight, especially to those who were seeing the birds come in for the first time. The first of the birds arrived from a westerly direction just on 7.45, and they were quickly followed by a continuous stream, which lasted for over twenty minutes. When most of the birds had settled on the rookery Mr. F. Lewis and the party commenced examining the birds for rings which had been placed on the legs of two thousand young birds by officers of the Game Department. This interesting experiment had been instigated by Mr. Lewis for the purpose of ascertaining whether the young birds returned to the rookery again, and although over a hundred birds were examined that night none was found to have a ring.

At 3.15 a.m. next morning some of the party turned out to see the birds go out to sea again. In many instances, just prior to daylight, both birds were seen sitting at the entrance to the burrow, but as dawn approached their quarrelling ceased, and by 3.50 a.m. silence reigned.

During the morning Mr. F. Lewis led the party over the whole rookery, and directed attention in many places to where the birds had been driven to seek new localities through the destruction of their rookery by the sweeping sand. The burrows were also being badly damaged through cattle and sheep, which were grazing over the whole of the Cape.

The party returned to camp in time for lunch, and in the afternoon a meeting was held under the ti-tree on the beach for the purpose of discussing the future welfare of the rookery. Mr. Pescott, President of the Field Naturalists' Club of Victoria, presided, and several members of the W.E.A. brought forward suggestions. All speakers were emphatic in their remarks that the preservation of the rookery was a matter of great importance, and that steps should be taken immediately to acquire the private property over which the rookery extended, and the whole Cape be declared a National Park. Further, it was decided to open a subscription list for the purchase of the land.

The remainder of the afternoon was devoted to an examination of the portion known as the Narrows, where the sand has swept right across from the west to the east beach. That evening the party again waited for the arrival of the birds, and again several scores were caught and examined, but without finding any rings.

Early next morning the boat arrived and conveyed the party to Newhaven. Melbourne was reached in due course.

The thanks of the Council of the Royal Australasian Ornithologists' Union are due to Mr. F. Lewis for the hospitality given to its delegates during their stay at the Cape, and especially for the interest and support he has given to movements to secure the preservation of the Mutton-bird rookery at Cape Woolamai.

The Condition of the Mutton-Bird Rookeries, Phillip Island, Nov., 1927

By A. G. CAMPBELL, J.P., Member of R.A.O.U. Council,
Kilsyth, Victoria.

The flying visit to the small rookeries did not reveal much beyond the fact that at the Reserve of eighteen acres, the Fisheries and Game Department have done excellent work in protecting and conserving the natural cover of the sand hummocks besides the planting of marram on the raw sand dunes. In great contrast is Dixon's (Murray's), where only about one acre of burrows was left of twenty-five, and Fletcher's fifty acres, which is nearly all cleared out owing to the marram being burned at the wrong time. It is pleasing to see one farm, Forrest's, well planted with marram, and the cattle feeding in an amphitheatre of pasture behind the sand hummocks, while the neighbour's block is little else but shifting sand. Here was noticed the King Island Melilot, which, with the spear grass, has done so much to make the pasture land of that island.

On Cape Woolamai there has been considerable change since my last visit in 1913, when observations were made on the effects of the egging season (see *Emu*, Vol. XII., p. 271). While not pessimistic, or prepared to say that the numbers of birds have noticeably decreased, or that the total area of burrows is smaller than formerly, I, nevertheless, think the time has come to have some definite policy for the protection of the rookery as a whole. Burning, grazing, and, to some extent, egging, have rendered the sand hummocks in many parts unstable, and they have begun to move from one portion and to deposit themselves on another, thus doing the Cape a double injury.

The sword-grass rookery, which we knew on the south coast immediately across the neck from the camping site, has been entirely denuded. I did not see a single blade of sword grass left, while the sand, darker in colour than ordinary sand-dune, is transported inland by the wind and distributed over an area of perhaps thirty acres to a depth of eighteen inches among the bracken fern. Birds have burrows all round the edge of this, but the sand is said to be moving forward at the rate of five chains per annum.

Compensation is found, however, in the fact that birds have gone into the Aster-covered hummocks to the west of this, and now occupy a strip about fifty acres from coast to coast, which from my notes I find was not part of the rookery in 1913.

Again, at the head of the pig-face rookery on the south coast was a considerable area, perhaps thirty acres, covered with scrub and much spinach (*Tetragonia*). This has all gone, and the detritus moved inland over the Cape, but at a higher level than the other blow. Fences are down, and all that remains of the hummocks are little islands with a tussock or two attached, in which an odd pair of birds may burrow. Birds also try their luck in the dark under-strata that is exposed, but the area is too windswept.

The lower part of pig-face rookery remains, and is an excellent example of the binding properties of that plant, *Mesembrianthemum australe.* The scene as shown in *Nests and Eggs* (Campbell), p. 892, is yet intact.

It should be noticed that the two sand-blows referred to have occurred since 1913, but there was then a blow about midway between, exposing the calcined roots and stumps of ti-tree and other scrub which once grew on the dark grey soil. These are still seen lying about, together with the detritus of birds and blackfellows' middens, but the whole area for the length of nearly a mile and an area of about fifty acres is the most desolate proposition on the Cape. Fortunately, there is much of the ancient dark grey dune-sand exposed (or old time soil), which is firmer, and which would quickly be covered by planting in a favourable winter. The marram grass has proved itself the best for loose sands, and should be planted without delay wherever rookeries are threatened. Excellent cover of marram can be seen near the central older portion of the south-coast blow planted years ago by Mr. Cleeland, Senr.

On the inner or north-eastern side of the Cape, rookeries are continuous almost from the granite brow to Red Point and Beacon Point, a distance of about sixty chains, and an area of about sixty acres, one-half of which is new since my last visit. But here the sand is also troublesome, being dislodged in easterly weather, and, like the sand from the other blows, being driven uphill on to the headland. The sand here has been planted with marram by the Fisheries and Game Department in conjunction with the owner of the land with the object of conserving the rookeries. There is much spear grass about this portion which also is an excellent sand stay. Lastly, from a pastoral point of view, I am strongly of opinion that the Cape has rapidly deteriorated and would not carry now a sheep to ten acres.

For the preservation of the rookeries it is necessary that all grazing be stopped. Marram should be planted on all loose sand, and when this has established itself in a year or two, effort should be made to resow the natural scrub like grey Aster, native spinach and largely pig-face, both native kinds and the showy introduced species. Boobyalla and Melilot could also be introduced among the hummocks once they are bound by marram.

The enormous series of sand dunes on the neck of the Cape has not been mentioned. This appears to be a natural feature of great age originating in the wide ocean back beaches, the raw sand advancing into the bay on the other side. Nothing need be attempted with this until the smaller local blows above referred to are checked.

Night Voices.—While chatting recently with Dr. Young, who takes an interest in our native birds, he mentioned that on two occasions this season he has heard nocturnal calls, which he took to be those of Dotterels, shortly before an atmospheric disturbance. The birds seemed to be circling in the air; the first time was in February, and was followed by high wind and rain; the second occasion was at the beginning of the present month of May, when a similar disturbance occurred. The Doctor's house is close to the estuary of the Mersey River, and only a few hundred yards from the sea-shore, so that he is quite familiar with all our shore-haunting species, and seems convinced that the callers were Dotterels. It would be interesting to know whether any mainland member has noticed this trait in the *Charadrius* or *Ægialitis* genus; there is not the least doubt that many birds feel approaching weather-changes long before we do.—H. STUART DOVE, F.Z.S., Devonport West, Tas.

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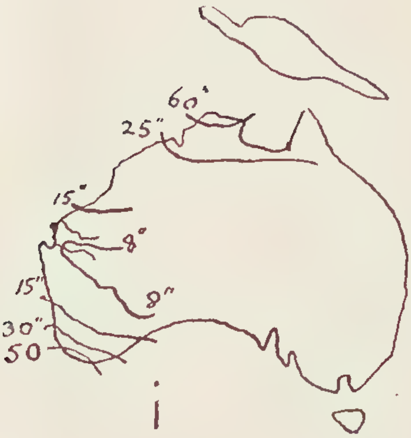
Elegant Parrots Visit an Orchard.—For some time past I have noticed a species of grass-parrot coming into our orchard; they seem to come for the seeds of the annual Paspalum, and do not touch the fruit. I got as close as I could to them, and compared them with the coloured plates that have appeared in the *Emu*, and they seemed most like the Elegant Grass-Parrot (*Neophema elegans*). The blue on the forehead and wing, however, did not seem to be present. They were yellowish underneath and light green above, and were yellowish about the cheeks. They had a soft call, and flew swiftly, like Lorikeets. As many as five of them came in from the south very early in the morning. They are intermediate in size, between the Western Rosella (*Platycercus icterotis*) and the Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*). These are the first Grass-Parrots I have seen in the district to the west of Rojonup. The Painted Quail (*Turnix varia*) come into the orchard after the Paspalum seeds, too.—A. E. FOLEY, "Wodenbillup," via Kulikup, W.A.

Relationship of the Avifauna of Western Australia

By ROBERT HALL, C.M.B.O.U., F.A.O.U., Sometime President R.A.O.U.

The distribution of birds in Western Australia is peculiar, and is due largely to its great wedge of low rainfall of from 1 inch to 3 inches. The birds of the north-west are mostly derived through the north from Queensland, while those of the south-west have arrived there through south-eastern Australia, also from Queensland. This is well shown by the Thornbills (*Acanthiza*) and Scrub-Wrens (*Sericornis*), two large genera of fifty-four species and sub-species. They have expanded from the east of the continent along two lines (Map II.), the northern and the southern. The barrier between these lines is shown in Map XI. The Thornbills, of thirty species and sub-species, have one species only in north-west Australia (Area 8, Map II.), and that doubtfully so, while there is only one listed from Northern Territory [Area 1 (G. M. Mathews*)]. The Scrub-Wrens, of twenty-four species and sub-species, have no species in Area 8, the nearest being one species on Bernier Island. The Restless Flycatcher (*Seisura inquieta*) and the Ground Cuckoo-Shrike (*Pterypodocys maxima*) have the same method of range and expansion. The 8in. average maximum rainfall shown in Map I. is a barrier to dispersal, the minimum being 1in. The eastern side opens out into an extensive, dry, broad desert of 3in. minimum to 10in. average maximum rainfall (Map XI.), to the north and south of which (Map XII.) the birds of Western Australia found their way from eastern Australia with its much greater rainfall. This appeals to me as the period when the eastern birds had some considerable time previously found a way southward from north-east Australia. Prior to this period, there was a great inland sea through the continent north and south, which was the first great and earliest barrier to westerly dispersal of the present bird-fauna. Though we can now form a fair idea of the origin of the present Australian birds, we may say nothing of the map before this era.

A second point of interest is; where do the southern and northern arms of eastern birds meet? It is, approximately, between the Ashburton and Gascoyne Rivers (Maps I., III., XI.). This is not in agreement with the map of the 1924 rainfall. The list below shows relationships and contrasts. It is a "no birds' land" where the birds of the north and south scarcely meet or just overlap numerically rather than specifically. Each has its own important genera, which extend



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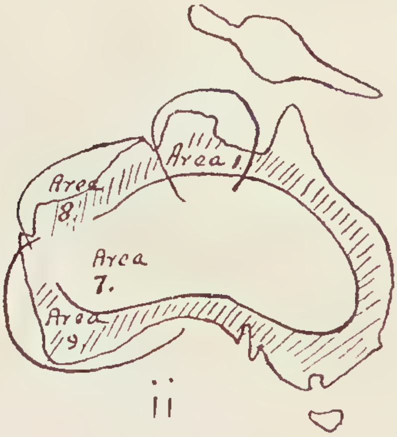

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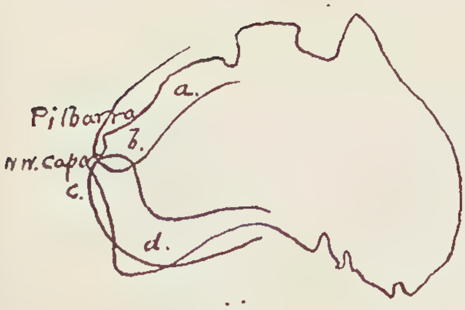

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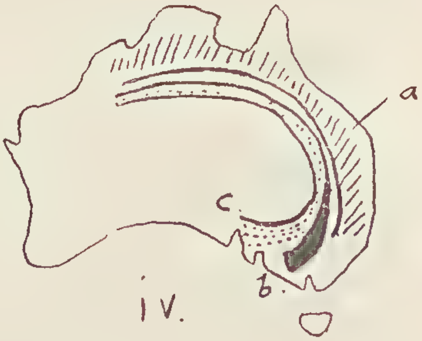

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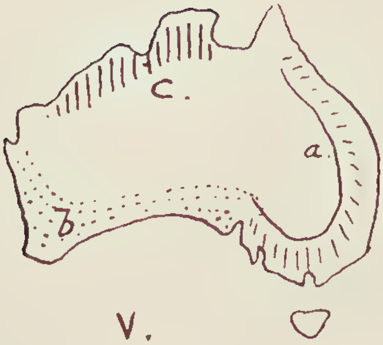

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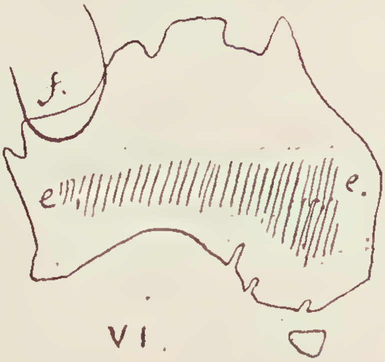

vi.

eastward, one route in the north through Northern Territory, the other in the south through Nullabor Plain (Maps I., III., X.).

The 50in. rainfall in the south-west (Map I.) holds examples of eastern birds that frequent the same moist type of forest country. South of the Nullabor Plain there was once similar country, now submerged as the Bight, that gave access, in the south, to the south-western. The rainfall of the Fitzroy River country and the southern Gulf of Carpentaria fringe is the same, and there is a likeness in the birds (Map VII.). To the north of this 20in. rainfall zone we find a 60in. one, which gives us a topographical darker phase in several species of the 20in. zone. I hold that my Areas 7, 8, 9,* as a whole, in average seasons are correct. Mr. Tom Carter has said† that Pt. Cloates, in the Ashburton country, is a part of the north-west of Australia, basing the statement on the endemic south-west species not getting further north than the Murchison River. He gives two species as examples, the White-tailed Black Cockatoo (*Calyptorhynchus baudini*), and the Varied Magpie (*Gymnorhina dorsalis*). Since then the White-tailed Magpie has been discovered further north, though I allow it may be an overlapping act.

What I want to impress is, that many southern birds that need not necessarily be endemic to the south-west of Western Australia get up to the Pt. Cloates country. In fact, there are twice as many southern birds about Pt. Cloates as there are northern birds. As the south-west of Western Australia is not a good species-making area, it is not called upon to supply them to the north; rather, we find it is the western birds still specifically southern that get so far north as the country between the Gascoyne and Ashburton Rivers. The country immediately south of the Ashburton River, with its direct inland course of three hundred miles, appears to me to be the normal southern boundary of north-west Australia—my Area 8—and the northern boundary of the birds of south-western Australia—Area 9. The Pheasant-Coucal (*Centropus*) finds its furthest south on the Ashburton River, while the Blue-winged Kookaburra (*Dacelo leachi*) gets south to the Gascoyne River. An examination of the birds immediately north of the Ashburton River (Pilbarra),‡ shows them to be distinctly northern, while birds to the immediate south (Murchison River) are distinctly southern. An interesting example of separation is to be found (Map III.) in the Whistlers of the genus *Pachycephala*, a broadly-distributed Australian genus. The species of the north-west are, for the most part, of different

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*Mathews and Iredale (*Manual of the Birds of Australia*), p. x. (1921), emphasise sub-species, while I speak of races.

†*Emu*, Vol. III., pt. I. (1903).

‡*Emu*, Vol. VIII., p. 4 (1909), F. L. Whitlock.

types from those of the south-west, with only one species of the eight on the junction-line (Ashburton district): a, a′ b′ c′ d′ = *P. melanura*, *P. falcata*, *P. simplex*, *P. lanioides*, *P. fretorum;* d, f′ g′ h′. = *P. occidentalis*, *P. rufiventris*, *P. gilberti*; b and c = one species each of a. Of these two groups of species, *P. falcata* and *P. rufiventris*, are practically alike. I take it they arrived by the northern and southern routes from the common abode of the east.

The true desert country (Area 7, Map II.) gives us the second and younger of the dichromatic avifauna with a hidden story of an origin earlier than the present list of birds.

In Map IV. we have three remarkable genera in the north-west, which have worked their way across from York Peninsula, as well in a southerly course, (4a) *Munia* (Finches). (4b) *Oriolus* (Oriole), (4c) *Entomyza* (Blue-faced Honey-eater), and *Philemon* (Friar-Bird). Of the sixteen species and sub-species of the Shrike-Thrushes (*Colluricincla*), we can see a definite arrangement into groups and oddments (Map V.), (a) The *C. harmonica* type, (b) the *C. rufiventris* type, (c) *C. brunnea*, *C. parvula*, and *C. woodwardi*, are three separate types, unlike a and b. Six of the above are mostly found in Queensland and beyond, while ten are eastern Australian and beyond.

The melanistic type of desert bird is the Short-billed Crow (*Corvus bennetti*), Map VI. e. The desert has not affected it as it has most of the species. The Spinifex-Bird (*Eremiornis carteri*), agreeing with its brown surroundings, is more closely related to an Asiatic bird, being scarcely separable from *Schœnicola* of India (Map VI. f.). It is a rare example of a north-west species having any other origin than that of Queensland, and would fit in with the theory laid down by the late Col. W. V. Legge. Further, eastern and southern distributions to be again referred to are shown in Maps XIII.-XVIII.

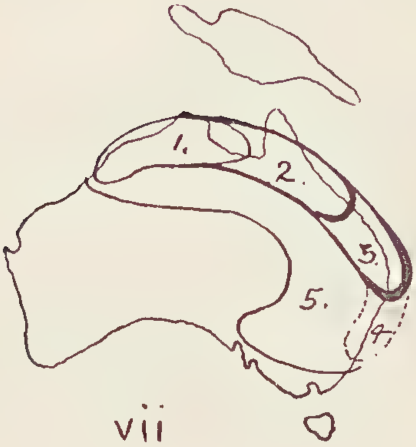
The north-west (Maps VII., IX.) about Broome and the Fitzroy River has species that are found in Area 2, other species found in 2 and 3, and still others found in 2, 3, and 4. They mostly show a Papuan origin. The characteristic birds of Area 1 are:—The Red-winged Parrot (*Aprosmictus erythropterus*), Black-tailed Tree-Creeper (*Climacteris melanura*), Black-ringed Finch (*Steganopleura annulosa*), Long-tailed Grass-Finch (*Poephila acuticauda*), Yellow-tailed Finch (*Donacola flaviprymna*), Pied Butcher-Bird (*Cracticus nigrogularis*), Silver-backed Butcher-Bird (*C. argenteus*), Rainbow-Pitta (*Pitta iris*), Rock-Pigeons (*Petrophassa*), Wood-Fantail (*Rhipidura rufifrons dryas*), Northern Rosella (*Platycercus venustus*), Buff-sided Shrike-Robin (*Poecilodryas cerviniventris*), White-quilled Honeyeater (*Entomyza cyanotis albipennis*), and the Great Bower-bird (*Chlamydera* *nuchalis*). Many other species which are also common to each of the Areas 2, 3, 4, 5, are found in Area 1. The three characteristic birds of Areas 1 and 2 are the Scrub-Fowl (*Megapodius reinwardt*), Large-tailed Nightjar (*Caprimulgus macrurus*), and the White-browed Crake (*Poliolimnas cinereus leucophrys*). The five characteristic birds of 1, 2, 3, 4 are the Koel (*Eudynamys orientalis*), Comb-crested Jacana (*Irediparra gallinacea*), Banded Grass-Finch (*Steganopleura bichenovii*), Jardine Caterpillar-eater (*Edoliisoma tenuirostris*), and Forest Kingfisher (*Halcyon macleayi*).

The characteristic birds of 1 and 5 are the Partridge-Pigeons (*Geophaps*), and the Little Corella or Blood-stained Cockatoo (*Kakatoe sanguinea*). The distribution of Black Cockatoos is shown in Map VIII., 3-7: 3. White-tailed Black Cockatoo (*Calyptorhynchus baudini*); 4, Great-billed Cockatoo (*C. b. macrorhynchus*); 5, Western Red-tailed Cockatoo (*C. b. naso*); 6, The Yellow-tailed, the Red-tailed, and the Glossy Black Cockatoos (*C. funereus*, *C. banksi*, and *C. lathami*); 7, The Yellow-eared Cockatoo (*C. funereus xanthonotus*).

Species 3 is derived from *C. funereus* of Area 6, while species 4 and 5 come through *C. banksi*. How was *C. naso* distributed? Was it one of the birds going south that passed the desert area south of the Gascoyne River?

The following birds are essentially those found south of the Ashburton River. They are not found north of it as permanents:—Musk Duck (*Biziura lobata*), Red-backed Kingfisher (*Halcyon pyrrhopygius*), Mallee-Fowl (*Leipoa ocellata*), Grass-Parrots (*Neophema*—7 species), Short-billed Crow (*Corvus bennetti*), Long-billed Cockatoo (*Licmetis tenuirostris*), and White-backed Magpie (*Gymnorhina hypoleuca*), being the southern and eastern bird, and *G. tibicen longirostris* being the northern bird, which gets a little further south. The genus is strong in the southern and eastern parts of the continent. *Psephotus* is a genus of parrots, ranging between the north-west and Queensland, and very closely allied to those of the genus *Neophema*. Gould saw that the effect on the northern birds was different from that on the southern birds, and separated them. The numerous species of Diamond-birds (*Pardalotus*) and Barn-Owls (*Tyto*), scarcely meet between the Areas 3 and 4, Map VIII.

The Wren-Warblers (*Malurus*), with their approximate distributions, are shown in Map XI.:—(1) The Blue Wren in the south, b, b′. (2) Red and Purple, north-west and northern d, e. (3) White-winged; dry buffer area a′, a″. (4) Eastern Wren-Warblers, f: We get the subdivisions (a) a′ Black and White Wren (*M. leucopterus*); a″ White-backed (*M. leuconotus*); (b) b′ Red-winged (*M. elegans*); b″ Splendid (*M. splendens*); c, Black-backed (*M. melan-*



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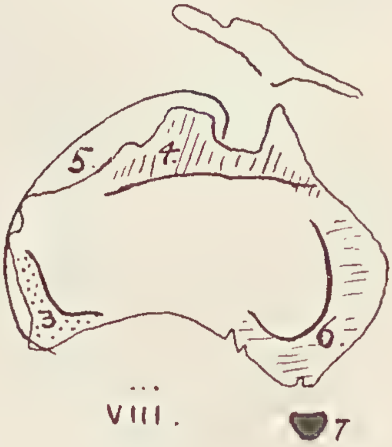

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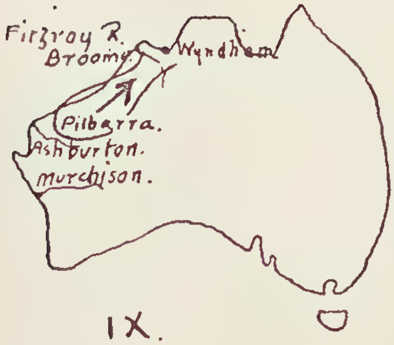

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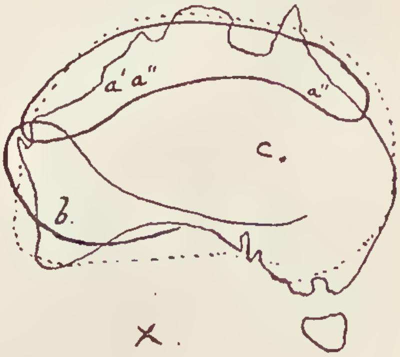

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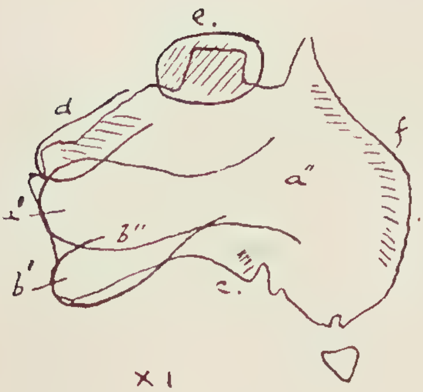

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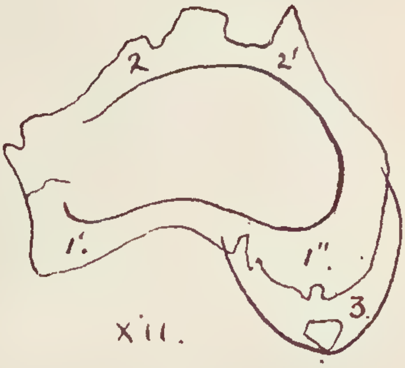


XII.

otus); Superb-blue (*M. cyaneus*); d, Lavender-flanked (*M. amabilis dulcis*). Variegated (*M. lamberti*), Red-backed (*M. melanocephalus cruentatus*); e, Purple-crowned (*Rosina coronata*); f, Lovely (*M. amabilis*), Variegated (*M. lamberti*), Red-backed (*M. melanocephalus*), and Superb-blue Wren (*M. cyaneus*). The Superb-blue Wren, on investigation, will probably prove to be the common stock of all *Malurus*. The Variegated Wren-Warbler (*M. lamberti*) and its phases are found mostly all round Australia, being strongest in eastern and southern portions. The Purple-crowned Wren (*Rosina coronatus*) is not directly derived from Queensland unless the derived type has disappeared, leaving a blank. The Splendid Wren (*M. splendens*) will probably indicate its derivation from eastern species. A study of the western species of Western Australia in the following list will indicate half of them from eastern Australia along the southern route, while the other half is peculiar and quite different from those species in the north-west of Western Australia derived through the Northern Territory from eastern Australia, *M. amabilis rogersi* being an example. Central Australia has the form *M. melanotus whitii*, Dark Turquoise Wren, differentiated from the eastern *M. melanotus*. North-west Australia has *M. amabilis dulcis*, *M. a. rogersi*, *Rosina coronatus*, and *M. melanocephalus cruentatus*. Northern Territory has *M. lamberti*, *M. a. dulcis*, *M. coronatus*, and *M. m. cruentatus*. West Australia has *M. splendens*, *M. leuconotus*, *M. leucopterus*, *M. elegans*, *M. l. occidentalis*, *M. l. bernieri*, and *M. pulcherrimus*. South Australia has *M. cyaneus*, *M. melanotus*, *M. m. whitii*, *M. callainus*, *M. leuconotus*, and *M. l. assimilis*.

The typical littoral country of the north-west, with clay-flats, thickets, grass plains and creeks, is observable as far south as the Ashburton district, but the birds are southern rather than northern. From an examination of the birds in the Ashburton district (Map IX.), principally of the lists of Mr. Tom Carter,* we may compile the following lists of the 164 species:—(a) North-west and northern, 14 species; (b) western and southern, 28 species; (c) over Australia, 122 species approximately (land and sea). Of 43 species of waders in list (c), one is northern, and two are southern.

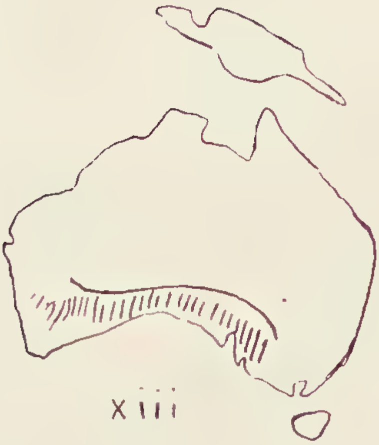
List A.—Of the 14 species, 11 are as follows:—a′, Map X.: Spinifex-bird (*Eremiornis carteri*), White-breasted Whistler (*Pachycephala lanioides*), Painted Finch (*Emblema picta*), Fawn-breasted Kingfisher (*Dacelo leachi cervina*); a′, a″: Pheasant-Coucal (*Centropus phasianinus*), Mangrove Kingfisher (*Halcyon chloris*), Beach Stone Curlew (*Orthorhamphus magnirostris*), Red-breasted Babbler (*Pomatostomus rubeculus*), Red-tailed Finch (*Bathilda ruficauda*), Golden-backed Honeyeater (*Melithreptus laetior*), and Freckled Frogmouth (*Podargus strigoides*).

**Emu*, vol. III., pt. 1, p. 30.

List B.—More western and southern (28 species):—White-fronted Chat (*Epthianura albifrons*), Pied Butcher-bird (*Cracticus nigrogularis*), Western Yellow Robin (*Eopsaltria griseogularis*), Black-capped Sittella (*Neositta pileata*), Western Silvereye (*Zosterops australasiæ*), Carter White-plumed Honeyeater (*Ptilotis penicillata carteri*), Yellow-throated Miner (*Myzantha flavigula*), Short-winged Frogmouth (*Podargus strigoides brachypterus*), Red-backed Kingfisher (*Halcyon pyrrhopygius*), Mallee-Fowl (*Leipoa ocellata*), Galah or Rose-breasted Cockatoo (*Kakatoe roseicapilla*), Elegant Grass Parrot (*Neophema elegans*), Red-throat (*Pyrrholaemus brunneus*), Wren-Warblers (*Malurus*), see Map XI., Western Shrike-Thrush (*Colluricincla rufiventris*), Hooded Robin (*Melanodryas cucullata*), Western Grey Fantail (*Rhipidura flabellifera preissi*), Rufous Field-Wren (*Calamanthus campestris*), Thornbills (*Acanthiza*), Scrub-Wrens (*Sericornis*), and Emu-Wrens (*Stipiturus*).

List C.—Broadly distributed over Australia:—Wedgebill (*Sphenostoma cristatum*), Mistletoe-Bird (*Dicaeum hirundinaceum*), Black Honeyeater (*Myzomela nigra*), White-fronted Honeyeater (*Glyciphila albifrons*), Pied Honeyeater (*Grantiella picta*), Singing Honeyeater (*Meliphaga virescens*), Spiny-cheeked Honeyeater (*Acanthagenys rufogularis*), Red-browed Pardalote (*Pardalotus rubricatus*), Welcome Swallow (*Hirundo neoxena*), White-backed Swallow (*Cheramoeca leucosternum*), Australian Tree-Swallow (*Hylochelidon nigricans*), Australian Pipit (*Anthus australis*), Masked Wood-Swallow (*Artamus personatus*), Little Wood-Swallow (*A. minor*), Chestnut-eared Finch (*Taeniopygia castanotis*), Fork-tailed Swift (*Micropus pacificus*), Spotted Nightjar (*Eurostopodus guttatus*), Owlet-Nightjar (*Ægotheles cristata*), Rainbow-bird (*Merops ornatus*), Sacred Kingfisher (*Halcyon sanctus*), Pallid Cuckoo (*Cuculus pallidus*), Black-eared Cuckoo (*Owenavis osculans*), Narrow-billed or Rufous-tailed Bronze Cuckoo (*Chalcites basilis*), Little Corella (*Kakatoe sanguinea*), Cockatoo-Parrot (*Leptolophus hollandicus*), Budgerygah or Warbling Grass-Parrot (*Melopsittacus undulatus*), Diamond-Dove (*Geopelia cuneata*), Ground Dove (*G. placida*), Common Bronze-wing Pigeon (*Phaps chalcoptera*), Flock-Pigeon (*Histriophaps histrionica*), Crested Pigeon (*Ocyphaps lophotes*), Black-faced Cuckoo-Shrike (*Coracina novæ-hollandiæ*), White-winged Triller (*Lalage tricolor*), Red-capped Robin (*Petroica goodenovii*), Black and White Fantail (*Rhipidura leucophrys*), Song-Larks (*Cinclorhamphus*), Quails (*Synoicus* and *Turnix*), Coot (*Fulica*), Bustard (*Eupodotis*), Pectoral Rail (*Hypotænidia philippensis*), Oriental Pratincole (*Glareola maldivarum*), Southern Stone-Curlew (*Burhinus magnirostris*), and the Magpie-Lark (*Grallina cyanoleuca*).

An example of a genus expanding from eastern Australia through Victoria, South Australia, and Western Australia up to the Northern Territory, is the Hooded Robins (*Melanodryas*). This is how it appears on the map; the Hooded species (*M. cucullata*) stays south of the Ashburton R., while the northern Hooded Robin (*M. c. picata*) does not come south of the Ashburton, and is not recorded further east than the Northern Territory. Diamond-birds (*Pardalotus*) and Barn-Owl (*Tyto*) are not ordinarily found between 3 and 4, Map VIII. Exceptional circumstances do send them on to the barrier. The Yellow-necked Mangrove Bittern (*Dupetor gouldi*) is an example of the few species of birds found just south of the Ashburton River that are not found in Victoria, though well distributed over Australia.



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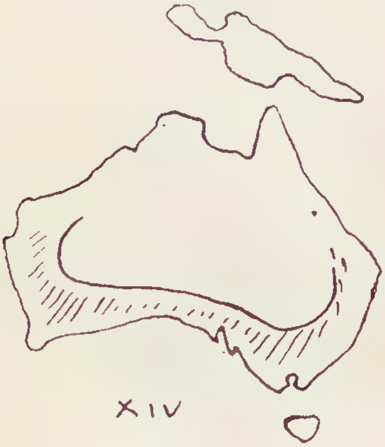

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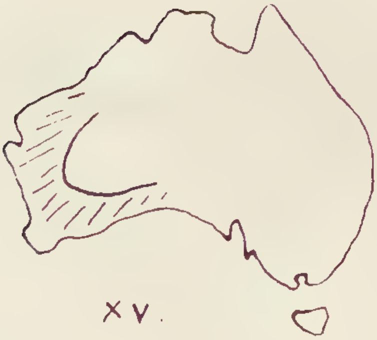

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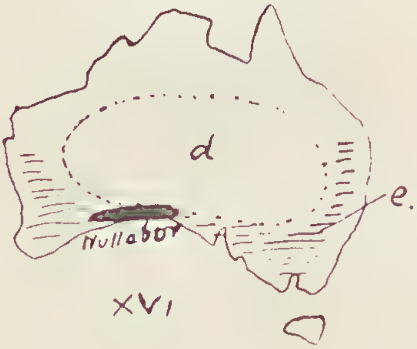

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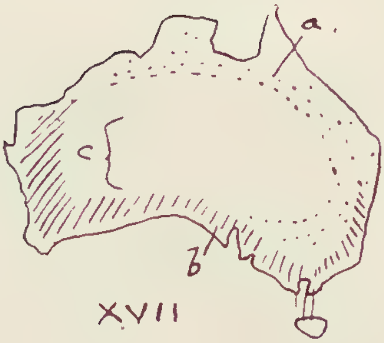

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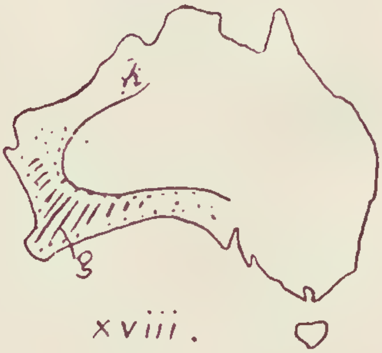

XVIII.

In consulting Whitlock's list in *The Emu*, VIII., pt. 4, we find in the Pilbarra district (Map IX.) the following fifteen species essentially northern, and not southern, subject as in the case of the Golden-backed Honeyeater to being erratic in abnormal seasons:—Fawn-breasted Kingfisher, Spinifex-bird, Northern Hooded Robin, Pied Butcher-bird, Black-tailed Tree-creeper, White-breasted Whistler, Banded Honeyeater, Chestnut-rumped Pardalote (*Pardalotus melanocephalus uropygialis*), White-breasted Honeyeater (*Gliciphila fasciata*), Red-faced Finch, Grey-headed Honeyeater (*Meliphaga keartlandi*), Yellow Miner (*Myzantha flavigula lutea*), Coucal and Beach Stone-Curlew. The Brown Weebill (*Smicrornis brevirostris*) is thought by Whitlock to be the bird he saw. This is a southern species, and would be an interesting extension of distribution. The northern is the more highly coloured species, the Yellow Weebill (*S. flavescens*). The species meet about here.

The littoral distribution of the genus of Honeyeaters, *Melithreptus*, apparently has one barrier (Map XII.). It is the very feeblest contact of the northern and southern races in the west:—

(a) a′, Brown-headed Honeyeaters—1′, *Melithreptus brevirostris leucogenys* (Western Brown-headed Honeyeater); 1″, *M. brevirostris* (Brown-headed Honeyeater).

a″, White-naped Honeyeater—1′, *M. lunatus chloropsis* (Western White-Naped Honeyeater); 1″, *M. lunatus* (White-naped Honeyeater).

(b) 2, *M. laetior* (Golden-backed Honeyeater); 2′, *M. albogularis* (White-throated Honeyeater).

(c) 3, *M. validirostris* (Strong-billed Honeyeater); *M. brevirostris magnirostris* (Island Brown-headed Honeyeater); *M. affinis* (Black-headed Honeyeater).

It is interesting to find in both north-west and south-west of Western Australia, the western representation of eastern Australian species of a genus.

The bird life of the district of Broome (Map IX.) is certainly made up of species which are north-western, and not western. These include the Forest Kingfisher, Black-banded Finch, Masked Finch (*Poephila personata*), Long-tailed Finch, and Black-tailed Tree-creeper.

The birds of the Fitzroy River country extend for the most part southward to the Ashburton district, but no further south, their origin being in north-eastern Australia. These include *Petrophassa albipennis* (White-quilled Rock Pigeon), *Geophaps smithi* (Partridge-Pigeon), Masked Plover (*Lobibyx miles*), Oriental Cuckoo (*Cuculus optatus*), White-quilled Honeyeater, Red-headed Honeyeater (*Myzomela erythrocephala*), Rufous-banded Honeyeater (*Conopophila albogularis*), Yellow Oriole, Red-collared Lorikeet, Great-billed Cockatoo, Freckled Frogmouth, Chestnut Rail (*Eulabeornis* *castaneiventris*), Red-backed Wren, Brown Shrike-Thrush. Gouldian Finch (*Poephila gouldi*), Chestnut-breasted Finch (*Donacola castoneothorax*), and White-breasted Finch (*D. pectoralis*).

The birds of the Murchison district (Map IX.) are of south-eastern origin, the two strongest examples being Thornbills and Scrub-Wrens. The Thornbills include thirty species and sub-species, all of southern and eastern Australian habitat, excepting the Chestnut-tailed (*Acanthiza uropygialis*), which is found well north of the Murchison and over the continent. Gregory M. Mathews has thirty species and sub-species listed, none of which occurs between the Murchison and the Northern Territory. There are nine species and sub-species in Western Australia, south of the Murchison River. Scrub-Wrens (*Sericornis*) have twenty-four species and sub-species according to Mathews's list, none of which, with one exception, that found on Bernier Island, occurs between the Murchison and Gascoyne Rivers. They are well distributed over southern and eastern Australia. The Striated Pardalote (*Pardalotus striatus*), Crested Pigeon, and the Dusky Moor Hen (*Gallinula tenebrosa*) are common about the Murchison River, but not on the Ashburton River. The Grey Honeyeater (*Lacustroica whitii*) is a species that should be able in particular to pass north over the Ashburton country. It seems again to be a question of definite food supply.

The Hooded Robin, Western Yellow Robin, Leaden Bell-Magpie (*Strepera versicolor plumbea*), Western Spinebill (*Acanthorhynchus superciliosus*), Red Wattle-bird (*Acanthochaera carunculata*), Little Wattle-bird (*Anthochaera chrysoptera*), are Murchison and southern birds. See also Map XII., *Melithreptus.*

Birds of the south-west forests have been partly listed by the late Mr. A. W. Milligan on the western side,* and by myself on the eastern.† These lists certainly show their relationship with many species of the Nullabor Plain and the south-east of Victoria. The following list will show the dissimilarity with most of the birds of North-west Australia and the likeness to those of south-eastern Australia:—The Noisy Scrub-bird (*Atrichornis clamosus*), Western Bristle-bird (*Dasyornis longirostris*), Red-eared Finch (*Zonaeginthus oculatus*), Western Scarlet-breasted Robin (*Petroica multicolor campbelli*), Western Whipbird (*Psophodes nigrogularis*), White-eyed Honeyeater (*Melithreptus lunatus whitlocki*), Long-billed Honeyeater (*Meliornis novae-hollandiae longirostris*), Moustached Honeyeater (*M. niger*), Red-capped Parrot (*Purpureicephalus spurius*), White-tailed Cockatoo (*Calyptorhynchus*

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*Emu, II., pt. 2, Margaret River.

†Ibis, Jan., 1912; Albany-Denmark.

baudini), Western Ground Parrot (*Pezoporus terrestris flaviventris*), Leaden Bell-Magpie (*Strepera versicolor plumbea*), a member of a genus of six southern and eastern species.

A list of the species some two hundred miles from Perth has been made by Mr. Alan Crossman.* Excepting six species, which are Western Australian, the whole list is southern Australian, derived through South Australia from eastern Australia; or clearly are closely related species, *e.g.*, Western White-eared Honeyeater (*Meliphaga leucotis novaenoricae*), Yellow-plumed Honeyeater (*M. ornata*), Western Rosella (*Platycercus icterotis*), Stubble Quail (*Coturnix pectoralis*), Southern Stone-Curlew (*Burhinus magnirostris*), Banded Plover (*Zonifer tricolor*), and Black-breasted Wren. Of the twenty species of Wren-Warblers (*Malurus*), four only are found in North-west Australia, the bulk being in the southern and eastern portions of the continent. Lists have been given by Mr. W. B. Alexander and Mr. A. W. Milligan of birds found in the Stirling Range,† Wongan Hills,‡ Bremer Bay,†† and Moora. The great majority of the species are derived from eastern Australia through western New South Wales. A list of the birds of the western side of Nullabor Plain, Map XVI., has been given by Mr. C. G. Gibson,** and shows ninety species, not including hawks and water birds. The great majority is derived through South Australia from western New South Wales and western Victoria. The balance is found well distributed over the continent, but with an eastern association. At the Eucla Bight, the country is a tableland of limestone. This is where the West Australian bird fauna of the south begins. In the blue bush, we find the Large-tailed Grass-Wren (*Amytornis textilis*); in the coastal fringe, the Leaden Bell-Magpie; in the mulga, the Western Grey Fantail; in the salmon-barked gums, the Western Shrike-Tit (*Falcunculus leucogaster*); in the coastal sandhills, the Western Silvereye (*Zosterops australasiae*); and in the denser eucalyptus country, the Twenty-eight Parrot (*Barnardius semitorquatus*). Numerous species common to South and Western Australia are to be found in the Nullabor Plain at Eucla. Four Cuckoos, the Pallid Cuckoo (*Cuculus pallidus*), the Fan-tailed Cuckoo (*Cacomantis flabelliformis*), the Black-eared Cuckoo (*Owenavis osculans*), and the Narrow-billed Bronze Cuckoo pass over from South Australia to the Nullabor Plain. It would be interesting to know exactly their course of annual migration.

Those deep-living forest genera, the Scrub-Robins (*Drymodes*) and the Whip-birds (*Psophodes*), are found to the

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[*] *Emu*, vol. IX., pt. 2, p. 84.
†*Emu*, vol. III., pt. 1, p. 9.
‡*Emu*, vol. III., pt. 4, p. 217.
††*Emu*, vol. XVI., pt. 1, p. 24.
***Emu*, vol. IX., pt. 2, pp. 71, 76.

east and west of the Nullabor Plain, but not upon it. Map XVIII. h. shows the habitat of the following four species:—Western Shrike-Thrush, the Redthroat, the Allied Flycatcher (*Microeca fascinans assimilis*), and the Rufous Tree-creeper (*Climacteris rufa*). Did these species arrive by a northern or a southern immigration route? or a more central expansion from the east? Map XVIII., g, shows the Western Grass-Wrens (*Amytornis macrura* and *A. textilis*), which are, and have been, desert birds from very early times. The ancestor of the Chestnut-breasted Whiteface is another desert bird, while the ancestor of the eastern Australian species is a plain grey. The Western Shrike-Tit (*Falcunculus leucogaster*) is the western representative of the Eastern Shrike-Tit (*F. frontatus*); *F. whitei* is the north-western representative of it. The Western Whistler (*Pachycephala pectoralis occidentalis*) is derived from the east. The two mud-nest builders of the east, Grey Jumper (*Struthidea cinerea*) and the White-winged Chough (*Corcorax melanorhamphus*) have not arrived in areas g and h.

The following species are some of those distributed across the southern part of the continent, as shown in "e," Map XVI.—Little Cuckoo-Shrike (*Coracina robusta*), Hooded Robin, Western Warbler (*Gerygone fusca*), Yellow-rumped Thornbill (*Acanthiza chrysorrhoa*), Purple-crowned Lorikeet (*Glossopsittacus porphyrocephalus*), Black-throated Butcher-bird, Tawny-crowned Honey-eater (*Gliciphila fulvifrons*), Yellow-plumed Honey-eater (*Meliphaga ornata*), Yellow-tailed Pardalote (*Pardalotus xanthopygius*), Red-backed Kingfisher (*Halcyon pyrrhopygius*), Hooded Dotterel (*Charadrius cucullatus*), The Chestnut Quail-Thrush (*Cinclosoma castanotum*) is found along the inner marginal line. The Shy Ground-Wren (*Hylacola cauta*) is excepted from Queensland and New South Wales of XVI., e, its place there being taken by the Chestnut-tailed Ground-Wren (*H. pyrrhopygia*). The White-face (*Aphelocephala leucopsis*) is the eastern species occupying the western portion of g (Map XVIII.).

Map XVII., a, b, c, shows approximately the distribution of the three plumage types of Australian Magpies (*Gymnorhina*). If my previous thought that the Black-backed Magpie is the forerunner of the White-backed is correct, it would appear that the origin of the Magpies may be in the Papuan sub-region:—(a) *G. tibicen* (Black-backed Magpie); (b) *G. hypoleuca* (White-backed Magpie); and (c) *G. dorsalis* (Varied Magpie). Our Magpies appear to be dichromatic, all races of the one species, with the insular Tasmanian form smaller instead of larger.

Map XIII. shows the approximate distribution of the southern and south-western forms of the Brown Thornbills west of the Murray flats. It also shows the area of the half-dozen races or sub-species of the Spotted Scrub-Wren (*Sericornis maculatus*), with a western extension to Bernier Island by *S. m. balstoni.* In Map XIV. the distribution of the black and white section of the White-fronted Chats (*Epthianura albifrons*) is shown. The yellow section (*E. aurifrons* and *E. crocea*) occupies the interior of the remaining part of the continent. The red section (*E. tricolor*) is found practically all over Australia, excepting the heavy coastal forests. Map XV. gives the uncommon distribution of a species expanding well into the north. It, the Western Fantail (*Rhipidura preissi*), is almost identical with the eastern form, *R. flabellifera albiscapa.*

Map XVI., d, shows the home of the Cinnamon Quail-Thrush (*Cinclosoma cinnamomeum*), Crested Wedgebill (*Sphenostoma cristatum*) Pink Cockatoo (*Kakatoe leadbeateri*), Australian Dotterel (*Peltohyas australis*), Black-faced Wood-Swallow (*Artamus melanops*), White-backed Wren (*Malurus leuconotus*), Whiteface (*Aphelocephala*), and the Long-tailed Parrots (*Polytelis*).

Though this paper deals with areal contact and main immigration routes, so far as the present avifauna is concerned, it does not take into consideration erratic seasons and temporary trespasses of certain species. This is shown to be interesting in eight species that have been considered purely northern and north-western species, but which have been recorded in the Ashburton district, south of their true habitat. These are the Spinifex-bird, Painted Finch, Fawn-breasted Kingfisher, Coucal, Mangrove Kingfisher, Beach Stone-Curlew, White-bellied Whistler, and Red-faced Finch.

LYREBIRDS FOR TASMANIA.

After trying unsuccessfully for two seasons past, it is hoped this year to liberate, in the Russell Falls, National Park, Southern Tasmania, three pairs of Lyrebirds. Typical Lyrebird country is available there in considerable area. No fox is found in Tasmania, and the two large marsupial carnivores, the Tasmanian Devil and the Tasmanian Wolf or Tiger, are now so rare that they are not likely to interfere with the successful establishment of the Lyrebird in that area.

Similar suitable country for Lyrebirds is available in Flinders Chase, the great National Park, in the western end of Kangaroo Island.

Bird Notes and Birds' Notes

By Mr. C. BRYANT, Melbourne, communicated by Mr. R. T. Littlejohns, R.A.O.U.

> "The birds around me hopp'd and play'd,
> Their thoughts I cannot measure,—
> But the least motion which they made
> It seem'd a thrill of pleasure."
> —Wordsworth.

Surely it is not necessary, as is so often indirectly suggested, to analyse, *post mortem,* the result of a bird's recent gastronomical achievements, to collect evidence in favour of the argument in support of the plea for protection. With the exception of possible proved serious pests, the birds' mere presence, enlivening our parks and bushlands with flashes of colour and sweet strains of music, is surely of itself sufficient to ensure the birds' safeguard from harm. Who but the callous boy with a shanghai, or the "sportsman" of the rabbit-chasing variety, shooting anything he sees when his legitimate prey baffles him, would destroy one of our glorious parrots or a magpie carolling in the big gums? The latter bird enjoys a fairly widely-recognised immunity, although his pugnacious habits at nesting time often place him under an odium. The magpie is credited with a deal of sagacity, but his intelligence evidently does not extend to an understanding of the transparency of glass. I recently saw a magpie make repeated efforts, from outside, to catch flies on the inside of a window overlooking a paddock where his kind congregate, beating a dull tattoo on the glass in his efforts to secure an easy titbit, and finally flying away utterly chagrined. But whatever be his sagacity, his courage is undoubted. How often is he seen, generally with a friend, chasing hawks, or even the smaller eagles, with no uncertain spirit? At Towanga, in the mountains of north-eastern Victoria, we once came upon a magpie standing straddle-legged before a five-foot black snake, seemingly holding the reptile's attention and preventing it from crossing the road. My friend suggested that the bird was mesmerised by the snake, but I think that most unlikely. Whether the magpie would have called up his friends and have dealt summarily with the snake, as the Indian crows deal with the large scorpions of that land, we did not have the opportunity of observing, for, unfortunately, our advent, and desire to despatch the snake, caused the bird to fly, the snake immediately making for cover across the road. And, after all, it beat us to its hole, and got safely away.

The magpie's carol is common enough to need no special description of it, but it is of interest to note what John Gould and others have written about it. "The Bird Man" confessed his inability adequately to express the bird's song. "To describe the notes of this bird," he wrote, "is beyond the power of my pen." "Famous vocalists!" "The wild carol is wonderfully rich and clear, falling away in sweet flute-like notes." Those and similar eulogies are heaped on the bird on all sides. And is not the specific name of the Black-backed species—*Gymnorhina tibicen*—a "flute-player"?

Another bird whose name is indicative of his vocal talent is the Grey Thrush—*Colluricincla harmonica.* He has many full and mellow notes, one of which in particular always takes my fancy—his enquiring, "Where're you working?" He is soberly clad, but if you watch him closely you will see unexpected shades of blue in his grey plumage.

Many suggested translations of birds' calls are existent, but it is difficult in most cases to pin the notes down to any certain words. It is so easy to interpret a bird's song to suit the ear of the listener. Mrs. Gene Stratton-Porter says that certain notes of the American Oriole have suggested to one observer the spinning song from Martha—

"I can wash, sir, I can spin, sir,
I can sew, and mend, and babies tend."

That seems a grandiloquent effort by the bird, or by Mrs. Stratton-Porter's informant, for, in my opinion, the fewer the notes the more definitely can those notes be restricted with certainty to any special words. The outstanding calls of our birds that resemble human words are, in my own experience, those of the pilot-bird *(Pycnoptilus floccosus)*, which truly says "a guinea a week"; the mournful "curlew" of the migratory Eastern Curlew *(Numenius cyanopus)*, and the "oree-oree-ole" of our Olive-backed Oriole *(Oriolus sagittatus)*. The female Eastern Whip-bird *(Psophodes olivaceus)* often says "which are we" in answer to her lord's whipcrack; the Noisy Friar-bird *(Philemon corniculatus)* calls for "tobacco, tobacco," and yet more "tobacco"; Satin Flycatchers *(Myiagra cyanoleuca)* are insistent on notifying you that they are "pretty." Crescent Honeyeaters *(Phylidonyris pyrrhoptera)* call "Egypt"; but most of these birds have other notes with which they so often vary the above calls that one might only occasionally hear those words "spoken" by the birds. As an example of that, I might say that never have I heard a Willy Wagtail *(Rhipidura leucophrys)* say (which he is always credited with saying), "Sweet pretty creature," or anything like it. His commonest call, to me, is a rather harsh "rikka-tikka-tikk," a call which time after time I have heard assertive bird observers call the note of the Restless Flycatcher or The Scissors Grinder *(Seisura inquieta)*. The call of that bird is rather slower and more even, and, although it is difficult accurately to indicate the difference, fairly dissimilar from the note of the Wagtail.

Of our introduced birds, probably the most human note is one of the calls of the Common Myna *(Acridotheres tristis)*, which often calls "choke him, choke him," even though no object of his thuggish propensity is apparent. The characteristic wheezing of the Starling *(Sturnus vulgaris)* is varied by some very full notes. All are familiar with the songs of the Song Thrush *(Turdus philomelos)* and the Blackbird *(Turdus merula)*, and the gentle "coo" of the Indian Turtle Dove *(Streptopelia chinensis)*. The last is often very deceptive, inasmuch as it appears to proceed from a tree some distance away, while in reality it is just overhead. The architecture of this bird, like that of most of the pigeon tribe—*Columbiformes*—is amusing. Of all the jerry-built nests, the dove's frail structure is one of the worst. The eggs are nearly always visible from beneath.

One of my favourites is the Bell-miner *(Manorhina melanophrys)*. He always amuses me—a clown of the bird world, a Grimaldi of the feathered tribes. His yellow bill, contrasted so strikingly with the rest of his body, appears to be, although not actually so, most disproportionately large. He pokes it at you from the dense tea-tree growths of the creek-side. You can see it before you see the bird, for his green form is difficult to perceive; he says "tink" at you, and is gone. Another humorist is the Brush or Little Wattle Bird *(Anthochæra chrysoptera)*. His comical notes are a treat to listen to. "Cookay-cook," he calls with much inflexion, now low, now shrilly, even harshly, governing his "*expressione*" by variations of pitch and an occasional cadenza of gurgles. Then he perceives you watching him. He turns his head sideways, and eyes you coldly, remonstratively it appears, as one caught committing some foolish prank, who by his disdainful and unrepenting gaze dares you to chide him for his misdeed. After this supercilious survey, he registers his disapproval of you in a harsh "kwock," and removes himself to the next tree.

Thornbills *(Acanthizæ)*, Wrens *(Maluri)*, and Scrub-wrens *(Sericornes)* are what one might term "fussers." They creep through the thickets scolding and fussing the while. The Thornbills are a difficult group to distinguish, for the yellow-tailed *(A. chrysorrhoa)* is like the buff-tailed *(A. reguloides)*, the brown *(A. pusilla)* similar to the striated *(A. lineata)*, and they simply will not remain still long enough to allow one to discern their distinguishing marks. The Superb Blue Wren *(Malurus cyaneus)* is called, in some districts, the Mormon Wren, on account of his apparent harem of little brown ladies. These are most likely the young of the year's first brood; and sometimes "big brother" even assists in tending his new little sisters and brothers. At Wandin I saw two fully-plumaged males engaged in supplying a nest full of hungry youngsters with "small game." Evidently "Uncle" was gaining experience preparatory to taking on himself the responsibility of rearing children of his own.

Reverting to the Leatherhead or Friar Bird's call, and to the intepretation of a bird's notes to accord with what a listener would have him say, I remember once when we were making for Mt. Wellington and its tiny mountain tarn, by the unusual approach through the Moroka Valley. We had reached the junction of the Wonnangatta and Moroka Rivers, but could not find the old mining track up the valley of the latter stream. We were poking about on the river flats, when a loud ringing call of a Leatherhead *(Philemon corniculatus)* half-way up the hill on our left, was so suggestive of "Moroka, Moroka" that we laughingly moved in the bird's direction—and found the track. That call was the one which is invariably described as "Tobacco, Tobacco." Another example is the "mo-poke" call of the Boobook Owl, the "boobook" of the natives. Despite my own assertions as to the difficulty of agreement as to the calls of birds, I was surprised to see that Mr. C. F. Belcher, in his book on *The Birds of the Geelong District,* says that never has the call of the Boobook Owl sounded to him exactly like the syllables "mo-poke." Its call was, I thought, one which was fairly generally admitted to be "mo-poke."

One cannot extol our birds' songs without referring to our many-voiced Superb Lyrebird *(Menura novæ-hollandiæ).* His versatility is well advertised, and appreciated. The liquid notes of the Whistlers (*Pachycephalæ*) and of the Grey Butcher-bird *(Cracticus torquatus)* are also fit subject for inclusion.

Fairy Martins at Gingin, Western Australia.—Last Easter, from April 5th to 9th, 1928, I was a member of a party from the University which was doing geological work at Gingin, 42 miles north of Perth, and on the western side of the Darling Range. The bird life of the locality, which is at the northern boundary of the Swan River district, as defined by Mr. W. B. Alexander, interested me. As a result of the trip it is possible to add another species to the Swan River district avifauna. At the chalk quarry on One Tree Hill, Gingin, Mr. L. Glauert, Curator of the W.A. Museum, who was also a member of the party, drew my attention to a number of nests built under an overhanging face of chalk, and which, though most of them had been more or less damaged, were readily recognisable as nests of a colony of Fairy Martins (*Hylochelidon ariel*). There were seventeen of them at this spot, and in two kilns near by nine and three others respectively were discovered. The nests appeared fresh enough, and might have been occupied last season. Nearly twenty-five years ago Mr. F. Lawson Whitlock saw Fairy Martins' nests, without actually meeting with the birds themselves, at Mogumber, 23 miles in a north-easterly direction from Gingin. He states (*Emu*, Vol. IV., p. 135): "I did not actually see this species, but photographed a group of nests in a recess of a limestone cliff about three miles west of Mogumber." These birds seem to be quite scarce in the south-west of this State, and apparently they are local in their distribution. The finding of these nests at Gingin makes this the nearest place to Perth at which the birds have been known to occur.—D. L. Serventy, 34 Onslow Road, Subiaco, May 2, 1928.

Notes Made During a Visit to the Bogong High Plains, Victoria

By Miss A. PATERSON, Bay-street, Port Melbourne,
communicated by Dr. J. A. Leach.

During a recent visit to the Bogong High Plains, in the Alpine district of Victoria, the average altitude of which is over 5,000 feet above sea-level, and the summit over 6,500 feet, the highest mountain in Victoria, our party had the good fortune to make some interesting observations, some of which are here recorded.

Leaving Melbourne by car, our route led us to Glen Wills, an old mining town, some 35 miles from Omeo, via Wangaratta, Tallangatta and the Mitta Valley.

Those dapper little gentlemen, the Willie Wagtail *(Rhipidura leucophrys)* and the Scissors Grinder *(Seisura inquieta)*, together with the equally attractive Magpie-lark *(Grallina cyanoleuca)*, were observed practically throughout the trip. Magpies were very plentiful, and a careful watch was kept all the way up the Sydney-road, but Benalla (100 miles) had been passed before the first black-backed *(Gymnorhina tibicen)* was seen. From there to Tallangatta and down the Mitta, the black-backed variety was the only one observed. On the plains themselves, the magpies were all white-backed *(G. hypoleuca)*. This seemed peculiar to us, for the plains are now rather more on the northern slope of the Alps than on the southern, though doubtless they were part of the original Dividing Range.

We were greeted on reaching our camping spot, about 17 miles out of Tallangatta, by the noisy screeches of a flock of the Sulphur-crested White Cockatoos *(Kakatoe galerita)*, which, wheeling backwards and forwards, made a very pretty picture in the light of the setting sun. The yellow crests were very prominent. Eventually the birds roosted in an old white gum across the river.

We were treated to a rather remarkable sight at breakfast next morning. Two Kingfishers of different species perched above mid-stream on a wire rope stretched across the Mitta River. The first was the Sacred (*Halcyon sanctus*), and the Blue (*Alcyone azurea*) soon joined it. Breakfast was forgotten in the pleasure of watching these beautiful birds, which seemed to be aware of the interest they had aroused. During the whole time they were not more than 15 feet away, so we were able to get an excellent view.

Continuing our journey along the road, some 20 feet or so above the level of the river, we were able to look down on the adjacent lagoons. I was surprised to note the number of Cormorants, as I had previously regarded them as being mostly birds of the sea-coast. Some were the Little Black *(Phalacrocorax ater)*, but by far the greater number were the White-breasted or

Pied *(P. fuscescens* or *P. varius)*; it was difficult to decide which. One of our party was rather amused at what she called the "Scarecrow Birds," these being the Cormorants, in typical attitude, with wings hung out to dry.

The Eastern Swamphen *(Porphyrio melanotus)*, with its red bill and legs, and the Black Coot *(Fulica atra)*, with its bluey-grey bill and red eyes, were very busily engaged darting here and there, while the lagoons were just full of wild duck.

The White-faced Heron *(Notophoyx novæ-hollandiæ)*, with its peculiar flapping flight, and the Straw-necked Ibis (*Threskiornis spinicollis*), with its long curved bill, were also noted, mostly in ones or twos.

The Nankeen Kestrel *(Falco cenchroides)* proved to be a rather startling example of protective coloration, the rufous back absolutely toning in with the swamp weeds round about. These birds typify patience of the highest order—nearly all we saw appeared to be waiting for some poor unfortunate upon which to pounce.

As we proceeded farther up into the mountains round about Granite Peak and the slopes of Mt. Wills, numerous flocks of White-winged Choughs (*Corcorax melanorhamphus*) and Pied and Grey Currawongs *(Strepera graculina* and *S. versicolor)* were seen. The latter birds were called, in that district, the "rainbirds." A frequent reply by the residents to our questions regarding the weather was, "Of course it's going to rain; listen to them there Jays." The prophecy proved to be correct, for it did rain, and we have since noticed that when the Currawongs were most noisy more rain was about.

The Black-faced Cuckoo-Shrike *(Coracina novæ-hollandiæ)* was noticed in this region, and its peculiar shuffle of the wings on alighting was commented upon.

There is a thirteen-mile climb from Granite Flat to Christmas Creek (4,500 feet), the highest point on the road, and it was remarkable to note the change in the vegetation from the bracken, blackberries, Acacias, etc., of the lowlands, up through the white gums, mountain ash, and messmate to the beeches at about the 3,000 feet line, and then at about 4,000 feet the majestic woolly-butts were found. Higher still, of course, there are the snow-gums, gradually becoming more stunted, till at last even they ceased to exist. This road traverses one of the finest woolly-butt forests in Victoria; the trees have tall, straight trunks, and there is practically no undergrowth, except a carpet of the largest and deepest-coloured blue-bells it has ever been my pleasure to see.

Of the Parrot family, the scarlet-headed Gang Gang Cockatoos *(Callocephalon fimbriatum)* were very plentiful, as were the Crimson Rosellas *(Platycercus elegans)*, in both the green (young) and the crimson and blue forms (adults). Only one King Parrot *(Aprosmictus scapularis)* was seen on the whole trip, and that just below the edge of the plains; there was no chance of mistaking the beautiful scarlet and green male bird.

We found it difficult to determine whether the action of some Black Cockatoos *(Calyptorhynchus funereus)* merited praise or condemnation. On the track up to the plains, we heard a great screeching and squawking, and on looking up were astonished to see chips flying, as a result of the onslaughts of the yellow-tailed black Cockatoos on a bough of a eucalypt. Grubs must have been plentiful, for the going was fast and furious; but on our return some ten days later we were still more astounded to observe the bough on the ground completely eaten through, and absolutely rotten with grub holes. It would be interesting to know exactly how long it took those birds to eat through this bough, which was about 7 inches in diameter, and also how many grubs they are able to eat in a day. The economic value of these birds to the Forestry Commission must be very great.

Both the Flame and the Scarlet Robins *(Petroica phœnicea* and *P. multicolor)* were inhabitants of the plains, the latter being much more frequently met. Both kinds were rearing young, as also were the Greenies, or White-plumed Honeyeaters *(Meliphaga penicillata).*

One evening, towards sunset, a lone Emu *(Dromaius novæ-hollandiæ)* appeared on the horizon for some seconds. This was the only one seen by me, though other members of the party were more fortunate in seeing flocks of half a dozen or more.

A most inspiring sight that will not soon be forgotten was the view of a Wedge-tailed Eagle *(Uroaetus audax)* soaring round and round a rocky pinnacle known as the Ruined Castle. Eventually he came to rest on one of the crags. The word majestic is the only one that can be applied to this bird, and we gazed at it for some minutes as it stood immovable. On another occasion, the Lyrebird *(Menura novæ-hollandiæ)* delighted us with its beautiful song, though we were not fortunate enough to see it dancing on the mound.

February, at this altitude, is like Spring in the lower regions, and in the gullies the teatree, sassafras and clematis were still in flower, while the plains were carpeted with acres of wildflowers, including everlastings, shading from pale primrose to a deep brown; trigger plants of an intense magenta shade intermingled with the albino form; swamp daisies at least 3 inches across; orchids, blue-bells, asters and a little erect bell-shaped white flower, with brown markings, which grew in clumps, and which our guide called "snow-bells."

One must not forget to mention the Pipits or Ground-Larks *(Anthus australis)*, which were most common, a fact which was observed on a previous trip, when there was still some snow in the sheltered corners. These little birds were most industriously engaged in picking up insects from the hard snow. We could not understand how they managed to stand on the snow without freezing.

On our way home, just a few miles from Omeo, we found a bird, quite new to us, which we eventually identified as the

Rainbow-bird or Bee-eater *(Merops ornatus)*. It is most aptly named, for it really is an animated rainbow. Unfortunately, we were not able to see clearly one bird in the flock of thirty or so which had the two spine or racket feathers in the tail.

During our stay on the plains, we encountered rather bad weather. Rain and heavy fog hampered us, otherwise it is probable that our list would have been considerably increased, both as regards numbers of individuals and number of species. The more common birds, such as the Blue Wrens *(Malurus cyaneus)*, Yellow-tailed and Brown Thornbills *(Acanthiza chrysorrhoa* and *A. pusilla)*, Grey Fantail *(Rhipidura flabellifera)*, Sparrows *(Passer domesticus)*, and Starlings *(Sturnus vulgaris)*, were as abundant at this altitude as they were about Melbourne.

Fauna and Flora Reserves in Western Australia

By EDWIN ASHBY, F.L.S., C.F.A.O.U., Ex-President R.A.O.U., "Wittunga," Blackwood, South Australia.

The enclosed copy of a letter* recently received from the Under Secretary for Lands in Western Australia will interest every reader of *The Emu.*

To make this letter intelligible to readers, I will explain that during my visit of two months' duration to that State in September and October last it was my privilege to advocate the setting apart of numerous reserves in all possible districts, whenever I had the opportunity to do so.

In Perth, during the holding of the Congress, I twice addressed the Government Training College for Teachers at Claremont, the splendid Modern School at Subiaco, the official civic reception, the official opening by the Minister of the Crown, of Congress, and the Wild Flower Show, under the

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(Copy.)

*GOVERNMENT OF WESTERN AUSTRALIA DEPARTMENT OF LANDS AND SURVEYS.

Mr. Edwin Ashby,
"Wittunga," Blackwood,
South Australia.

Perth, 20th April, 1928.

Dear Sir,—

In reply to your letter of the 3rd January to the Hon. Mr. McCallum (Minister for Works), on the subject of the setting apart of Fauna and Flora Reserves in this State within a few miles of every township, I am directed by the Hon. the Minister for Lands, to whom the matter has been referred for consideration, to inform you that this Department will, as opportunity offers, create additional reserves for the protection of native flora as advocated by you, and will also continue the present policy of non-interference with existing reserves set apart for the same purpose.

Your correspondence on the subject is appreciated.

Yours faithfully,
(Signed) C. G. MORRIS,
Under-Secretary for Lands.

Auspices of the Western Australian Field Naturalists' Society, of which function I was the official opener. At all these gatherings, as well as personally to two members of the Ministry, was this question of reserves urgently pressed.

On returning to South Australia the interest and sympathy of Dr. Arthur W. Hill, Director of Kew, England, was enlisted, and he furnished me with a supporting letter dated 23/12/27, of which the following is an extract:—"I fully agree with all you say . . . as to the renewal of "Top-feed"; unless stock is excluded from such areas until regeneration by seedlings can take place, the areas will be reduced to desert conditions. Sir Thomas Hanbury, at La Mortola, Italy, was concerned at the absence of young trees on the Italian hills, where goats ran loose, and he fenced in an area, excluding all animals, with the result that seedlings eaten off, grew up, and fresh seedlings germinated, and now a dense forest is the result. no other action having been taken." "The Sand-plain flora in Western Australia is wonderful, and, as you know, unique, and areas should most certainly be reserved near any township. Everything possible should be done to prevent its destruction, especially as the land is not well suited for other purposes. It is a national heritage of which Australia should take the utmost care."

The following are extracts from my letter to the Hon. Mr. McCallum (Minister for Works) under date of 3rd January last:—

"I had the pleasure of meeting you on 21st October last; I then spoke to you about my concern that your Government should take up the matter of setting apart fauna and floral reserves within a few miles of every township, where your wonderful Sand-plain flora is within easy reach. Your native Sand-plain flora is unique; no other State in Australia, nor any other country, has such a unique flora, whose flowers, both in form and delicacy of colouring, are beyond compare. I would also most strongly advise that in your pastoral leases in the north-west of your State (I speak from personal observation only of the area between the Gascoyne and the Murchison), some clause should be inserted making it incumbent upon the holder of the lease to keep the stock out of certain portions of the leased area for a definite period of time in rotation, to enable the "Top-feed" to be renewed by the growth of seedlings." . . . I would, in conclusion, point out that both the matters urged herein are urgent. The adoption of the suggestions would cost the Government nothing. The rapid growth of farming settlement makes it desirable that all suitable fauna and flora reserves be made without delay. Once secure, they can be dealt with later. Possibly later some legislation kindred to the Wild Flowers Act of New South Wales might be passed."

Movements of Crows in Western Australia

By D. L. SERVENTY, State Secretary, R.A.O.U.,
34 Onslow Road, Subiaco, West Australia

The substance of these notes was prepared in 1922, but was laid aside with a view to amplification by further observation and information to be gleaned from other parts of the State. However, I have not been able to do either, and circumstances are such that it is improbable I shall be in a position to add to the information I have already gained for some time to come. The notes are offered, therefore, as being only a fragmentary contribution to a subject which only extensive travel in the State will enable one to treat with any pretensions to completeness.

Prior to 1923 I resided at Maddington, at the foot of the Darling Range, and it was in 1919 that I began to form an idea that the movements of Australian Crows (*Corvus cecilæ*) through the district were not entirely sporadic, but definitely seasonal, and having some of the elements of a true, if limited, migration. At the end of that year I saw numerous flocks of Crows flying southwards, the numbers in each flock varying from about ten to considerably over a hundred. Small parties of about 15 to 30 were, however, about the average. I did not give much attention to the matter at the time, but when, in the following season, December, 1920, a similar movement was observed I began to take notice, and commenced to record the numbers and direction of each flock that passed. As these observations were for the most part made during the week-ends, the notes dealt with only a fraction of the birds which actually passed over my "station," but, brief as they were, the records for the seasons 1920-21, 1921-22 and 1922-23 showed a striking similarity.

An analysis of the figures obtained indicated that there were two movements—south during the summer months and north during the winter. There was no perceptible interval between the two, excepting in the spring. When the southward movement is at its height the flight northward begins, and soon quite overshadows the other, continuing unchecked through the winter months. It seems to be an annual cycle broken at only one point. The movement southward is initiated in the first days of December, and all that month large flocks of Crows are to be seen passing over daily, the numerical strength of some of the flocks sometimes forming a spectacular sight. In January the return flight comes into evidence, but at least 70 per cent. of the birds seen are those winging their way southwards. In February the two movements are about equal in intensity, though sometimes in favour of the northward flight. Thus, in 1921, of the birds recorded, 77 per cent. were flying north. In March the northern movement is entirely predominant. It is in these four months that the two movements are most obvious, for in April, June, July and August, though the northward movement continues to hold sway, the flocks observed passing consist rarely of more than half a dozen birds, and their passage is much less frequent. There is practically no movement whatever amongst the Crows during September, October and November.

It was a peculiar fact that at Cannington, about four miles to the west on the coastal plain, this movement is very much less in evidence, and would certainly not impress itself at all on the observer. The same thing appeared to apply in other parts of the coastal plain near Perth, where I have had the opportunity of making observations. The southward and northward flight of the Crows was apparent only in the direct vicinity of the foothills of the Darling Range, which is merely the escarpment of the tableland, and which marks the line of faulting which has produced the coastal plain. The range is a low one, rising to a height of about 1000 feet.

It is very difficult to interpret correctly this movement on data obtained at only one point, but I submit the following hypothetical conclusions, which may or may not be upheld by subsequent investigation:—

1. The migrating Crows follow a narrow flight line from north to south, which is along the face of the Darling fault scarp.

2. The birds which enter into the migration are those which are unable to subsist throughout the year in any one definite part of the State. Certain parts of the country cannot support so many birds in one season as they can in another, and the migration under notice is the levelling up, so to speak, of the Crow population to adjust these seasonal differences in food supply north and south.

3. The winter rains have an influence as far north as Onslow, north of which extends the summer rain area. The summer rains commence in the East Kimberley, normally, in November, and work their way southwards till the north-west coast proper receives its first rains in January. From these facts we may perhaps be able to explain the Crow migration. The dry winter months in the north result in a lessened capacity of the country to support so many birds, the surplus of which gravitates southwards into the winter rainfall area, south of the Gascoyne. After the spring breeding season this necessitates a movement away from the saturated area, and as the influence of the winter rains is receding southwards, and the summer rains have not yet set in in the northern parts

of the State, the south-west forest zone receives an influx of Crows in December, continuing till the area is saturated. As the summer wears on the northern rainfall belt shifts southwards, and by January it reaches its southernmost limit, rendering the country habitable by a larger Crow population. This results in a reversal of the migration, and the more desirable Crow country in the north attracts an inflow of birds from the south, which continues the while the south-west country becomes less and less favourable to the birds during the cold of winter.

4. From a consideration of the rain distribution in the State given under note 3, it will be seen why the southward movement is comparatively short, while the northern movement is more drawn out.

6. The stationary period in spring may be attributed to its being, in general, the breeding period, resulting in a sudden influx south afterwards.

Bird Clubs

By A. G. CAMPBELL, J.P., R.A.O.U., Kilsyth, Vic.

Following a motion[1] passed at the Melbourne Congress of the R.A.O.U., 1925, that the Council be invited to prepare a scheme for closer co-operation between State members, with a view to strengthening the Union in its activities, the matter came up for discussion[2] at a conversazione in May, 1926, and was carried a step further, when the formation of branch committees, under article 26, was suggested.

I ventured to give some amplification to the ideas put forward in a paper[3] read before the Sydney Congress, 1926.

At Perth Congress,[4] 1927, the matter was again under discussion, with the result that three points for affiliation were set down. Thus, as far as possbile, members have been acquainted with the movement, and have taken part in the shaping of the ideas.

The Council, therefore, having adopted this report, desires it to be printed in the pages of *The Emu*, and will submit it to the 1928 Congress for approval and support.

The objects for which "branches" or local committees (now to be called Bird Clubs) shall be promoted are:—

(a) To increase the interest of members in the Union.

(b) To attract and educate others, including juniors, to become members of R.A.O.U., by means of associate membership.

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[1] *The Emu*, Vol. XXV., p. 149.
[2] *The Emu*, Vol. XXVI., p. 95.
[3] *The Emu*, Vol. XXVI., p. 193.
[4] *The Emu*, Vol. XXVII., p. 147.

(c) To assist the Union in carrying into effect locally its registered aims and objects.

(d) To secure in particular the survey, research and oversight of the avifauna (including sanctuaries) of the district in which the Bird Club is formed.

By-laws agreed upon are:—

1. Any five members of the R.A.O.U. in any town or district may form a local committee (to be called a Bird Club) associated with the R.A.O.U.
2. All the Club Officers shall be members of the R.A.O.U.
3. The Club shall adopt the Union's registered objects, 3a,[5] 3c.[6]
4. The Club shall send to Council regular reports of its activities and any matter likely to interest Union members generally.
5. Every Bird Club shall be self-contained and self-governing, and shall manage its own affairs as to meetings and outings, including the entire financing of its own domestic arrangements.
6. A Bird Club shall receive Council appointment as a local committee, under article 26,[7] submitting copy of rules with written application.
7. The Council may from time to time assist a Bird Club by donations or loan of books or papers, natural history specimens or lantern slides, or in any other way calculated to further the entertainment and education of members.

Finally, the Council proposes to set aside space in *The Emu* for Club reports. Council offers to publish good notes, papers or illustrations sent forward through a Bird Club.

It is proposed to enlarge the powers of the printing committee[8] to give them control over correspondence and reports arising from Bird Clubs, and the Council invites applications at once from any members proposing to form a Bird Club.

Dr. Leach has offered to give a public lecture on birds to inaugurate the first Bird Club formed in the State of Victoria under this scheme.

[5] 3a. "To promote the study and knowledge of ornithology and its advancement and popularisation and to take all and whatsoever means as may be considered most effective to preserve and protect the avifauna indigenous to or occurring in the Australian region or elsewhere and particularly in Australia, New Guinea and New Zealand and the islands and waters adjacent or contiguous thereto."

[6] 3c. "To establish and maintain such libraries, museums, scientific collections, laboratories and other scientific aid accessories and conveniences as may be deemed necessary or requisite for the information, entertainment, demonstration, education, convenience and use of the members of the Union."

The Silver Gull or Red-billed Gull (*Larus novæ-hollandiæ*).

Photo by R. T. Littlejohns, R.A.O.U.

726. "The Council may appoint any additional secretaries or assistant secretaries or other officers for special duties and in particular may appoint local secretaries committees or representatives in all or any of the States of the Commonwealth of Australia and in the Dominion of New Zealand or in any dependency district or districts of the said Commonwealth and Dominion and also may appoint any committees therein respectively and may delegate to them such powers authorities and discretions as such Council possesses and may think fit to delegate. The Council may at any time revoke any such appointment or appointments."

[8] An editorial committee is under consideration.

Camera Craft

The Princess Parrot.—The beautiful Princess Parrot was discovered in 1862 by the Stuart Exploratory Expedition into Central Australia, at Howell's Pond, in latitude 16° 54″ South. The new species was, in 1863, named *Polytelis alexandræ*, in honour of the then Princess of Wales, by John Gould. This very rare Parrot was observed by the Horn Expedition to Central Australia in 1894. It was seen, too, by the late Mr. G. A. Keartland in 1896-7, when with the ill-fated Calvert Expedition to the North-West. We are again indebted to Mr. J. A. Kershaw, F.E.S., R.A.O.U., Curator of the National Museum, Melbourne. He kindly granted permission to use, for the coloured plate, photographs of the fine group of three specimens mounted in different positions so as to show the chaste, delicate colouring of these exquisite, rose-throated birds, which are generally considered to be amongst the most beautiful of the parrot tribe. The total length of the bird is 15½ inches.

* * *

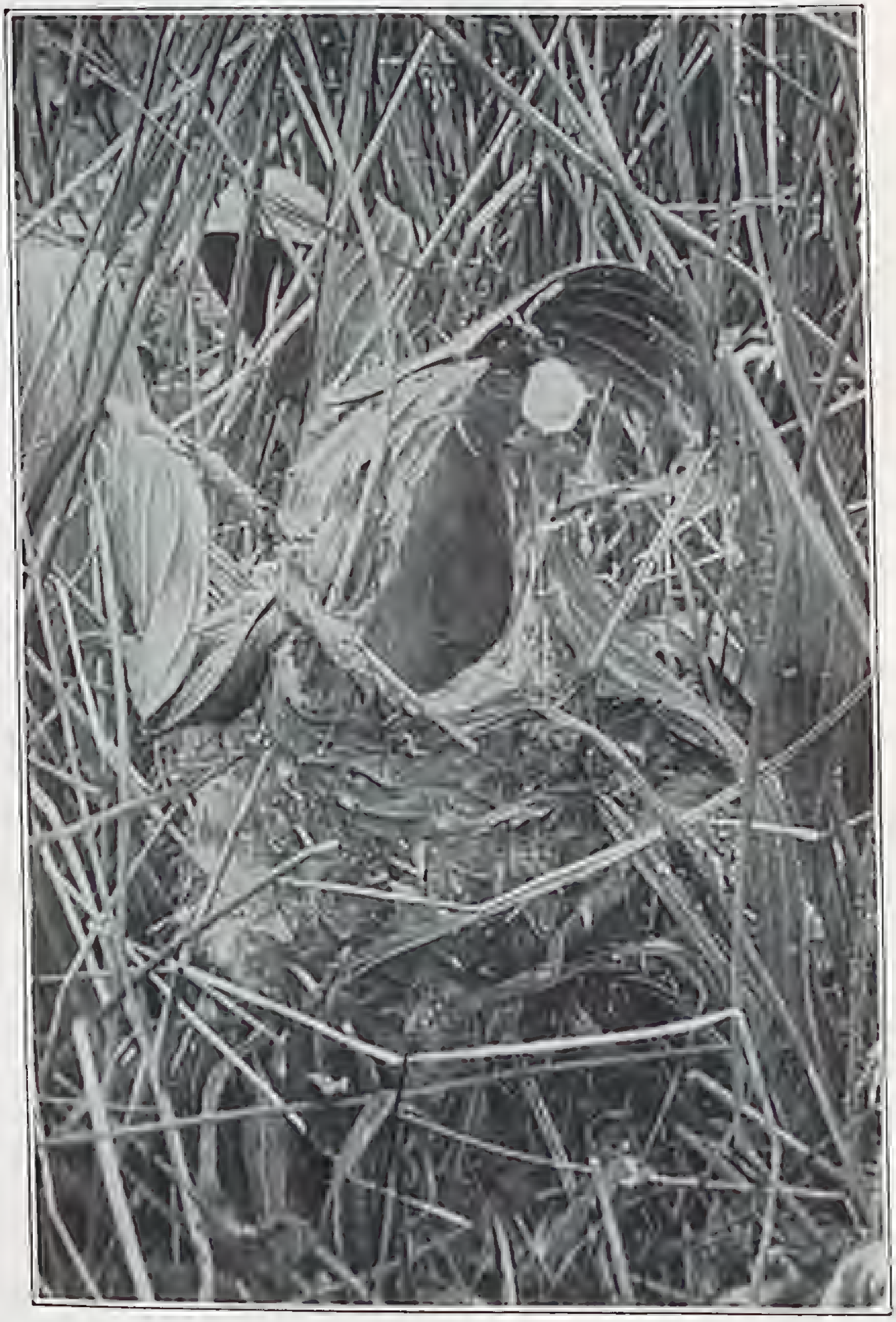
Silver Gulls at Elwood.—At many of the popular seaside resorts the Silver Gulls have become accustomed to the presence of crowds, and will approach quite closely for scraps of food. Subjects in this semi-tame state do not appeal to the photographer while other birds are nesting, but, after the close of the nesting season I spent one morning in an endeavour to obtain close-up pictures of this species, whose beauty, by the way, is likely to be overlooked by reason of its familiarity. Notwithstanding the apparent trustfulness, however, I found them rather difficult to photograph at rest. Raw meat was used as a lure, but the birds disliked the near presence of the camera, and persisted in snapping up the meat while they were on the wing. They were much too active for my fastest shutter speed. Eventually a tempting piece of meat was anchored to a large stone below the surface of the water, and the camera was trained on the nearest protruding rock. After two or three unsuccessful attempts to obtain the prize one fine Gull was surprised into perching for a few seconds on the rock to survey the position. I know of few other birds which have contours as pleasing as that of the Silver Gull (*Larus novæ-hollandiæ*) of Australia, Tasmania, New Caledonia and New Zealand.—R. T. Littlejohns, Melbourne.

* * *

Australia's Tailor Bird.—Though it is not generally known, in the Golden-headed Fantail-Warbler or Corn Bird *(Cisticola exilis)* of Australia, Tasmania, and the islands to India and Formosa, we have a bird which sometimes adopts methods of nest-building closely similar to those of the Tailor Bird of India, a related species. One nest which I found, instead of being securely woven in the centre of a tussock, after the style of most other nests of the species, was placed within two inches of the ground, and was without the protection of any tussock whatsoever. Instead, the nest was carefully camouflaged with the broad leaves of a common weed, whose seed stalks formed the main support of the nest. Several leaves had been drawn round the nest and fastened on with cobweb till almost the whole of the downy exterior of the nest was hidden from view. A casual spider's cocoon and a few dead leaves and stalks completed the deception. — T. V. Givens, R.A.O.U.

Stray Feathers

Spine-tailed Swifts Perching in Victoria.—A specimen of the Spine-tailed Swift (*Hirundapus spinicaudus*) was found dead beneath the telephone wire at 7 a.m. on the morning of the 10th February, 1925. Almost underneath the wire were several scarlet flowering gums, both *Eucalyptus calophylla* and *E. ficifolia.* They were just covered with blossom, and hundreds of moths were attracted to them by the quantity of honey. Apparently, the Swift struck the wire when hawking for his breakfast. It was the first I had seen at close quarters, though we were then used to seeing them in great numbers, especially before a storm. We used to marvel at the late hour they were flying round, even after the stars were out. Perhaps they had a roosting place in the tall timbers near the house. In February, 1898, was the only time we saw a Swift perch. That year, for days, one could see no distance for the smoke of bush fires. There was more standing dead timber then, and the Swifts, doubtless confused by the smoke, perched or propped themselves on the trunk of the trees. We have noted that Swifts are much rarer than they were formerly, though this year they have been unusually numerous.—C. C. Currie, R.A.O.U., Lardner, Gippsland (1928).



The Nest of the Fantail-Warbler or Australian Tailor-bird (*Cisticola exilis*).

Photo by T. V. Givens, R.A.O.U.

Bird Protection in New Zealand.— It is the policy of the Authorities in New Zealand to issue no permits to collectors resident outside the Dominion. Further, no permits are granted to take birds on sanctuaries, except for very special purposes, such as transferring a species to another sanctuary or locality. When any skins are granted to outsiders, it is the policy of the controlling department to collect these themselves for the applicant. This policy has been adopted as most fitting after past experience. Stewart Island is nearly all sanctuary. Fines in New Zealand are very heavy for shooting rare native birds.—E. V. SANDERSON, Hon. Secretary, N.Z. Native Bird Protection Society.

Deception Among Birds. — For the information of your correspondent, Mr. Otho Webb, R.A.O.U., not once only but many times have I been amused by the efforts of a panting oarsman to catch the black duck, which was "moulting, and cannot fly," but which, after floundering along for a few hundred yards just out of reach, rose easily aloft and winged its way back (but never directly, be it noted, always by a roundabout way) to its nest. Surely there cannot be any possible doubt of this kind of deception among birds being purposive and protective in object.—J. MURRAY ANDERSON.

Snowy Albatross in Tasmania.—A specimen of the Snowy Albatross (*Diomedea chionoptera*) was forwarded to the Tasmanian Museum on March 27th, 1928. The bird was found dead at Eaglehawk Neck by Miss J. A. Fletcher, R.A.O.U.

News and Notes

Editor of the Emu.—On account of ill-health, Mr. A. H. Chisholm, C.F.A.O.U., tendered his resignation as Hon. Editor. In accepting this with sincere regret, the Council expressed appreciation of the work done by Mr. Chisholm, and hoped that his approaching visit to Queensland will assist in the complete restoration of his health.

Foundation of an Advisory Council for Fauna and Flora.—Those interested in the preservation of the unique fauna and flora of Australia will be pleased to know that, after a long period of agitation, the Chief Secretary, Hon. G. M. Prendergast, M.L.A., has constituted the Victorian Advisory Council for Fauna and Flora. This consists of two representatives from each of the following seven societies:—The Royal Australasian Ornithologists' Union, The Bird Observers' Club of Victoria, The Field Naturalists' Club of Victoria, The Royal Zoological and Acclimatisation Society of Victoria, The Gun Clubs' Association, The Sporting Dogs' Club, and The Game Protection Society of Victoria. Dr. J. A. Leach was elected Chairman and Mr. N. Arnold, Hon. Secretary.

Coloured Plates.—Mr. Neville Cayley, M.B.O.U., after providing many paintings of Australian birds as originals from which the blocks for the coloured plates have been prepared, has been forced by pressure of work to notify the Council that he cannot continue to provide paintings. The Council ordered the inclusion in the minutes of a permanent record of its great appreciation of the high value of the service rendered by Mr. Cayley during many years past.

Meetings of Council of R.A.O.U.

The March meeting was held on Tuesday, the 13th. Mr. J. A. Ross occupied the chair.

In view of the proposal to hold the 1928 Congress in New Zealand, Mr. W. R. B. Oliver wrote supplying information as to a site for camp-out and the tentative arrangements for Congress. Since the previous meeting, however, it had been learned that the Articles provide for the holding of the annual Congress in an Australian State, and it was, therefore, necessary to defer the proposal to meet in New Zealand. In the meantime, Messrs. Chisholm and Wolstenholme will be asked to consider this amongst other matters when submitting proposals for amendment of the Articles. Regret was expressed that disappointment may have been caused to members in the Dominion.

The Chief Inspector of Fisheries and Game (Vic.) wrote acknowledging the valuable report submitted by Mr. A. G. Campbell regarding the Mutton-bird rookeries on Phillip Island. A resolution was carried thanking Mrs. Lambert for the gift of a very fine cabinet of microscopic slides of embryos.

Considerable time was devoted to correspondence in connection with the presidential address and the editorial footnotes published in *The Emu*. A resolution directing that footnotes be devoted, in future, to matters of fact was passed by a large majority. A resolution affirming the Council's opposition to collecting in schools was also passed. It was felt that the incident should be closed, and it was decided, on the advice of a majority of the members of the Printing Committee, not to print a further communication regarding the matter.

At the April meeting Dr. Leach occupied the chair. Further reference was made to the editorial footnotes which appeared in the January *Emu*. Some Interstate members asked that the Council should publish a disclaimer of the footnotes referred to. It was decided that no further action be taken.

At the suggestion of Mr. A. G. Campbell it was resolved that, as a first step towards the preservation of the Muttonbird rookery, the Lands Department (Vic.) be requested not to renew the grazing lease on Cape Woolamai.

Mr. N. J. Favaloro was appointed as one of the representatives of the Union on the Victorian Flora and Fauna Advisory Committee. A notice of motion forwarded by the President, Dr. E. A. D'Ombrain, suggesting a referendum of members on various questions was referred to the Sub-Committee which is dealing with amendments of the Articles. It was decided to accept for publication, if finances permitted, a valuable treatise on the Kangaroo Island Emu.

Consideration was given to a plan proposed by Mr. A. G. Campbell for the formation of branch committees or bird clubs. The proposal was received enthusiastically, and Mr. Campbell undertook to submit further details at the May meeting.

At the meeting held on the 8th May Dr. Leach again occupied the chair. Mr. Cayley wrote stating that it would be impossible for him to supply originals for coloured plates in future. It was resolved to thank Mr. Cayley for the very valuable gifts made by him in the past, and to express in a suitable minute the appreciation of the Council. Mr. A. J. Campbell wrote apologising for absence on account of illness, and it was decided to convey the sympathy of the Council. Mr. A. J. Campbell reported that a majority of the Printing Committee was in favour of accepting the treatise on the Kangaroo Island Emu. As the authors had offered a generous donation of £10, the cost of printing would not be at all serious.

Mr. Chisholm reported that Mr. H. A. White, of "Belltrees," Scone, has decided to donate Vol. 12 of Mathews's *Birds of Australia* and thus complete the very fine gift of his late father. The Council directed that a letter of thanks be sent to Mr. White, and another to Mr. Chisholm.

Mr. Chisholm wrote resigning as Editor of *The Emu*, and indicating that he was leaving for Queensland on a health trip. The Council expressed its appreciation of the very fine work done by Mr. Chisholm and its regret of the circumstances of his resignation. It was hoped that his trip would restore him completely to health.

Mr. J. N. McGilp and Professor Cleland forwarded a notice of motion in which it was proposed that the Council should disclaim responsibility for the editorial footnotes in January *Emu*. As the Council had already done this by restricted footnotes, further action was considered unnecessary.

The question of editing *The Emu* was discussed. Dr. Leach and Mr. A. J. Campbell were asked to carry on the work in the July issue until an Editor could be found. Messrs. Sharland and Kinghorn were mentioned.

Mr. A. G. Campbell gave further details of his plan for the formation of Bird Clubs as part of the Union's activity. A more detailed reference to the matter will be found elsewhere in this issue, and the Council recommended the plan for adoption by the next Annual Congress.

The June meeting was held on the 19th. Dr. Leach occupied the Chair. It was decided to allow the Advisory Council for Fauna and Flora recently constituted by the State Government to use the rooms of the Union for meetings.

Mr. A. G. Campbell reported having attended a meeting called for the purpose of forming an Avicultural Society in Victoria. It had been decided to form such a Society, and Mr. Campbell suggested that, later on, steps be taken to have the new Society affiliated with the Union.

It was decided to ask the Tasmanian Government to proclaim an area in the south-western portion of the Island as sanctuary in order to provide for the preservation of the Ground Parrot. It was also decided to draw the attention of the Commissioner of Police in Tasmania to the necessity for strict protection of these birds, especially during the forthcoming nesting season.

After consideration of the views of Interstate members of Council, it was decided that the Congress be held at Canberra this year, and the camp-out be held somewhere in the Federal Territory.

It was agreed to ask the Chief Inspector of Fisheries and Game for a permit to allow of the capture of three pairs of Lyrebirds for introduction into Tasmania.

The accounts necessary to close the financial year on the 30th inst. were passed for payment.

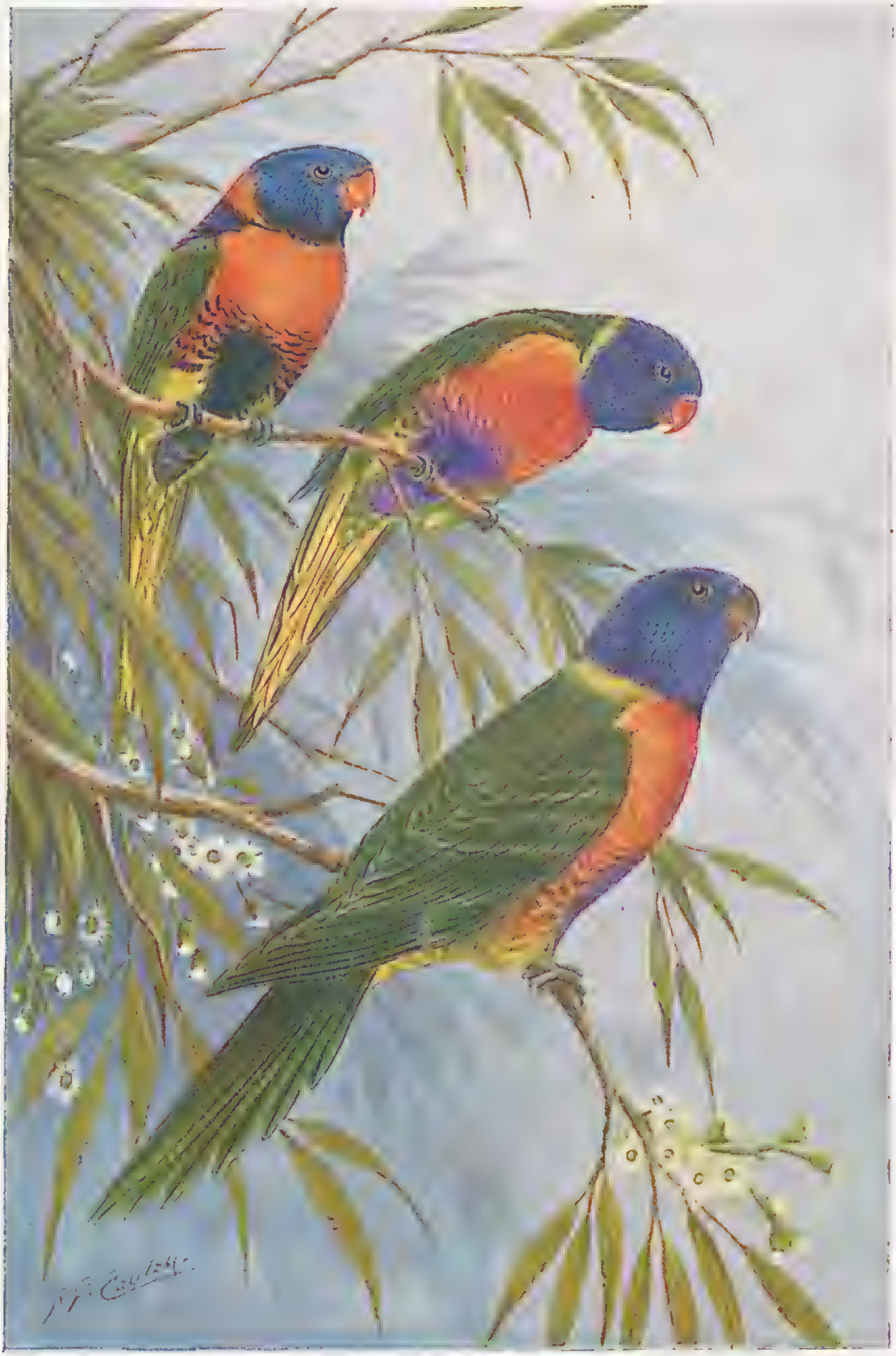
NEXT CONGRESS AT CANBERRA.

On account of a less favourable season in South Australia, the next Annual Congress and camp-out will be held at Canberra during the last week in October. It is hoped that there will be a large attendance of delegates and members. Early notification to State Secretaries is requested.

Early notification of items of business and nominations for office-bearers should be made to the General Secretary, Melbourne.

The date of publication was July 1st.

VICTORIA



AUSTRALIAN LORIKEETS

Trichoglossus colesi Le Souef

Upper left, T. rubritorquis, Vigors & Horsfield; *right, T. moluccanus,* Gmelin.

The Emu
OFFICIAL ORGAN OF THE
ROYAL AUSTRALASIAN ORNITHOLOGISTS' UNION

"Birds of a Feather."

VOL. XXVIII.] 1st OCTOBER, 1928. [PART 2

The Coles Lorikeet

By CLIFFORD COLES, R.A.O.U., 16 Bancroft Avenue, Roseville, N.S.W.

Much interest was excited by the skin of a Lorikeet exhibited at a meeting of bird lovers in Sydney recently, and, as the bird was so little known, the opinion was expressed that publicity in the columns of *The Emu* might bring to light more information concerning so interesting a form. The bird, *Trichoglossus colesi* D. Le Souef, is illustrated in conjunction with its near relatives, the Rainbow Lorikeet *(T. moluccanus)* and the Red-collared Lorikeet *(T. rubritorquis)*. (See coloured plate opposite.)

The specimen was obtained during the visit of the R.A.O.U. to the Capricorn Group, on the return to Gladstone, Queensland, on 8th November, 1910, by the writer, who, in company with Mr. Harry Burrell, left the Government trawler *Endeavour* for several hours to search the bush a little to the north of the town (following a hint by the local barber that some beautiful parrots were in the vicinity). Many eucalypts were in flower, and by the aid of glasses it was noted that Lorikeets were feeding. A bird was singled out, and shot, and it was at once seen to be so unusual that the flock was pursued to enable a further specimen to be obtained. Before this could be accomplished, the whistle of the *Endeavour* demanded our immediate return to the vessel. Lorikeets were plentiful, and as we retraced our steps every tree was hurriedly searched for the missing flock, easily distinguished by the smaller size of the birds and their duller colour. Many times we sighted them, but they had heard the gun, and were shy. Time was short, so with the desire to obtain a specimen for comparison, another shot was fired, and a brilliant specimen of the Rainbow or Blue-bellied Lorikeet *(T. moluccanus)* was obtained. These birds were exhibited on the trawler, and after skins had been made of them, and measurements and facts carefully noted, they were entrusted to the late Mr. Dudley Le Souef, who took them to Melbourne for identification, with the result that he pronounced one a new species, and described it as such in *The Emu*, Vol. 10, page 204, 1910, under the name *Trichoglossus colesi*.

The outstanding features of the bird are—taken by comparison with *T. moluccanus* obtained on the same day—length 2 inches shorter, wing ¾ inch shorter, tail 1½ inches shorter, eyes light yellow (red in *T. moluccanus)*, bill reddish brown, lighter at tip (red in *T. moluccanus*), banded upper surface (*T. moluccanus* green), "spatulate tips to lower secondaries, and marked with blue tips" as well as the tips "of some of the feathers on the shoulders . . . . upper tail coverts mostly tipped with blue; the four centre tail feathers green throughout, and the four feathers on either side of them have their outer web green, and with a portion of their inner web bright yellow and edged to the tip; these eight feathers are also spatulate . . . . flesh pink, not dark red as in *T. moluccanus*, breast bone ½ inch shorter than in that bird."

With the close protection afforded our beautiful birds, it may readily be admitted that in cases where close observation is necessary, much time must elapse before new species are thoroughly established; in the meantime, it behoves all bird-lovers to concentrate on the information available and endeavour to publish any new facts which may come to their knowledge.

Type Locality of the Corella.—The type specimen of the Corella, a Long-billed Cockatoo, was collected by Robert Brown at the You Yangs in 1802. The specific name *Kakatoe tenuirostris* is due to Kuhl (1820). The data ticket corresponds with Brown's visit to Arthur's Seat and Port Phillip Bay. It now seems certain that this bird was not merely a casual visitor to that part, but was a permanent resident. According to Horace Wheelwright, who camped for a few years on the Mornington Peninsula in the fifties, these birds were quite plentiful in the forest in those times. He generally found them in pairs, and common at all times of the year. It is difficult to understand the reason for the total disappearance of these birds from southern Victoria.—D. Dickison, Hon. Secretary R.A.O.U.

Galahs near Melbourne.—Whilst out between Pascoe Vale and Glenroy on Wednesday, August 29th, 1928, I noticed four Galahs or Rose-breasted Cockatoos *(Kakatoe roseicapilla)* come from a northerly direction and alight on the ground in the sheltered valley, where they remained some time. They had evidently been blown southward by the persistent northerly gale which was blowing at the time. Next day only one remained: it flew around for some time, but was not seen after that date.—T. Greaves, Bentleigh, Vic.

The Birds of Central Northern Victoria

By HUGH A. C. LEACH, R.A.O.U., Castlemaine, Vic.

In seasons of sufficient rainfall a good growth of "hog-weed" and "supple-jack" takes place in the stubble paddocks, and then is the heart of the shooter made glad, for Stubble-Quail *(Coturnix pectoralis)* are found in thousands. Not only in the stubble, but also in the adjacent grass paddocks are they found. When one sees these birds making, of their own volition, short flights in ripening crop, one may know that they are varying their food at the farmer's expense. Settling on a wheat stem they bear it to the ground, where they demolish the head at their leisure. The following incident was related to me by a reliable man. His sister, living in the Donald district, had her attention drawn one night to a scuffling noise outside the house. On opening the door, she found hundreds of Stubble-Quail crowded up against the door and sides of the house. Next morning not a bird was to be seen.

At different times I have found a few Stubble-Quail and also the Little Quail *(Turnix velox)*, whose wings, for some reason, had remained in an undeveloped state. As a result their bodies had grown too heavy, and the unfortunate birds were able only to flop up and down. The beautiful Painted Quail *(Turnix varia)* is found in fair numbers on the timbered hills. On one trip in the plain country, my setter dog found me a well-grown young Plain Wanderer *(Pedionomus torquatus)*. It was a very beautiful creature.

A few silver-grey Diamond Doves *(Geopelia cuneata)* visit us each year, and their loud, goose-like call puzzles many a bush dweller. Golden Wattles grow in profusion on the hills around St. Arnaud, and their seeds provide winter food for numbers of Bronze-wing Pigeons *(Phaps chalcoptera)*. The bush is so dense, however, that only brief views are obtained of them. Indeed, the observer becomes cognisant of their presence only when they "flap-flap-flap" through the timber. At odd times a bird may be seen walking majestically to or from water.

Odd pairs of Banded Landrails *(Hypotænidia philippensis)* are met with. They fly slowly, with hanging legs. This bird is a splendid runner, and, when surprised in the open, makes for the nearest cover at great speed. Small flocks of Dusky Moorhens *(Gallinula tenebrosa)* are encountered along water-courses, and sometimes close to large dams. On the swamps a few Hoary-headed Grebes *(Podiceps poliocephalus)* may be found feeding with the Ducks and other water-fowl.

Plovers.— Spur-winged *(Lobibyx novæ-hollandiæ)* and Banded *(Zonifer tricolor)*—abound on the plain country. So clever are they at hiding their young in the grass that an observer has, before he can find one, to "plant" himself behind some convenient cover, and wait until a young one rises and runs to meet the parent birds. Even then it is hard to locate the little chap, for at the first warning cry of the watchful parent he falls flat on the ground. Like young Dotterels, young Plovers are difficult to photograph in a standing position. When captured, they either lie down or "run for their lives."

Black-fronted Dotterels *(Charadrius melanops)* are found in odd pairs round the dams. They are most interesting birds. They nest always on rising ground, and generally 40 or 50 yards distant from the water. The nest consists of a ring of small stones or of short sticks, about half an inch in length, and of the same grey colour as the eggs. One nest found on a "slum" dam consisted only of three eggs, the grey colour of which almost matched the blue "slum" sand. Three days before the eggs hatched the birds surrounded them with over eighty small flat stone-flakes, and also made the nest cavity a little deeper. I did not succeed in finding the young ones in the nest, but they were certainly less than twenty-four hours old when they were discovered at the water's edge. The chicks are the downiest and softest things imaginable, and it is a matter for wonder that they are able to traverse the rough and stony ground between the nest and the water. They are very obedient to the calls of the parent birds. A certain call will send them in full flight across the wet mud. The observer follows. Another call sends them flat and motionless on the ground.

The habit of lying still if danger threatens is shown to a remarkable degree. They will stay in whatever position they happen to be placed. A young one was hurriedly dropped, and it fell with one leg raised off the ground. It lay in this position for twenty minutes by the watch. Not one of the chicks appeared to make the slightest movement, but the occasional flashing of an eye showed that they were attentively watching everything that transpired. Often the adult birds will lie down, spread out the tail feathers, and, alternately raising each wing, pretend to be wounded. The acting is perfect. Being birds that live for the most part on the margins of swamps and lagoons the sight of a wounded duck or some other stricken water-fowl would be quite a common occurrence, and this method of decoying an observer away would commend itself to these water birds more than the fluttering run of such land birds as Tangs or White-fronted Chats *(Epthianura albifrons)*, Pipits *(Anthus australis)*, and others. Though the marking of the adult bird is striking and would lead one to think that it could be discerned easily, such is the case only when the bird is moving. When stationary, the bird's plumage harmonises well with the sand and stones lying around. Protective coloration plays an important part throughout all the stages of this bird's existence.

A few Southern Stone-Curlews *(Burhinus magnirostris)* are occasionally observed on timbered plain country. They are fine runners, and take wing only when hard pressed. Ibises —

Straw-necked *(Threskiornis spinicollis)* and White *(T. molucca)*—are numerous on the swamps, but only odd birds are found round dams. Sometimes a small flock will visit a paddock infested with grasshoppers. They are very clever at catching yabbies or freshwater crayfish. Spoonbills *(Platalea)* occasionally visit the dams. White-faced Herons *(Notophoyx novæ-hollandiæ)* are common, and during the summer months a pair will work several dams, flying from one to another when disturbed. The drying-up of a dam provides easy food for these birds, and it is interesting to watch one of them "puddling" the almost dried up pool, thus bringing the tadpoles to the surface for air, when they fall easy victims to the stabbing bill of "daddy longlegs." The eyesight of this bird is wonderfully keen. From the shelter of a mia-mia I once watched a heron at his breakfast. When the moving form of a bird appeared in the sky the heron "pointed" it with his long beak, and as the bird moved overhead, the heron's long neck moved with it, and finally "pointed" it out of sight. Then breakfast was resumed, until another moving speck overhead necessitated another pause. A boy one day captured a young heron near a dam, and brought it to my house. We looked after it for a week. Its appetite was enormous, seventy tadpoles forming a meal. Though a slow-moving bird in the air, the heron is very quick off the ground. The powerful legs bend once, and the bird is propelled to a sufficient height to give the long wings free play.

When fishing along the Avoca River we sometimes found a Brown Bittern *(Botaurus poiciloptilus)* sitting in solitary state on a branch overhanging the water.

At night Black Swans *(Chenopis atrata)* may be heard "clanging" their way overhead. At such times they fly low, and occasionally one is found with a broken neck below a line of telegraph wires. I have known this fate to overtake ducks and also a bronze-wing pigeon.

Maned Geese *(Chenonetta jubata)*, Chestnut-breasted Shelducks *(Casarca tadornoides)*, Grey Teal *(Querquedula gibberifrons)*, Chestnut Teal *(Q. castanea)*, and Grey Ducks *(Anas superciliosa)* are frequently surprised on dams, and they, as well as Whistling Tree-Ducks *(Dendrocygna)*, Blue-Winged Shovelers *(Spatula rhynchotis)*, Hardheads *(Nyroca australis)* and Musk Ducks *(Biziura lobata)* are common on many of the swamps. Especially is this the case at Lake Buloke during a wet season.

Cormorants *(Phalacrocorax)* are met with along the rivers and on the lakes, where they do great damage to the fishing. I have a vivid recollection of seeing some thousands of these birds on their breakfast hunt just after daybreak. A startled exclamation from my fishing companion drew my attention to a dense line of Cormorants advancing low down across the lake. Then they took the water, and while hundreds stood up and beat the surface with their wings, advancing all the time, hundreds of others dived and chased the fish forward. The flock moved like a well-trained army, the right wing curving in as the birds approached shoreward. Then, with a rush, the fish were driven into shallow water, and breakfast was "on." The line broke up, and the birds dived and dived till their appetites were appeased.

Pelicans *(Pelecanus conspicillatus)* are found on Lake Buloke, and on the lakes at Avon Plains.

Of the Hawk family the most familiar are the Nankeen Kestrel *(Falco cenchroides)*, and the Wedge-tailed Eagle *(Uroaëtus audax)*. The appearance of a Hawk in the sky induces almost a paralysing terror in small birds. I have seen a flock of Sparrows take refuge in a small acacia bush, and the Hawk—a small one—follow them in. Not a Sparrow flew out, though their shrill chatterings showed that the raider was at work among them. Many times when driving through plain country, where trees were few and scattered, I have seen small flocks of Sparrows fly from the road across the paddock. The utterance of a shrill whistle, somewhat resembling that of a Hawk, was sufficient to bring the flock right back to perch in a tree quite close to us.

A nest of the Whistling Eagle *(Haliastur sphenurus)* was located in a standing crop. It was made of "Scotch" thistles, stood about three feet high, and contained two well-grown young ones.

Occasionally, a Black-shouldered Kite *(Elanus axillaris)* is seen against the summer blue. We often saw Wedge-tailed Eagles chasing hares, but never witnessed a "kill."

The intriguing call of the Boobook Owl *(Ninox boobook)* is often heard on summer nights, and frequently the bird is found during the daytime perched in a large eucalypt; his large, golden eyes, gravely curious, watching one's every movement. On our fishing trips to the Avoca River we often heard the Screech or Barn Owl *(Tyto alba)* at night. Our camp was pitched close to a tall, hollow tree, in which the bird had its home. By its fearsome screeching we could trace the bird's flight in search of prey from bend to bend of the river. Later its cry would come closer and closer, and finally we heard the bird scrambling into its hollow. Often on our morning trips along the river bank we found a small heap of feathers under a shrub overhanging the water. On one occasion we found the body of an Owl floating close to the bank. Whether it had fallen into the water when attacking its feathered prey or had attempted to catch a fish, we could not determine. We once paid a visit to a farm to view a Barn-Owl, which the farmer informed us had lived there for thirty years. We found that it, like other Owls, had no difficulty in flying by day.

Parrots abound throughout the district. The flowering of the Sugar-gums round our school attracted numbers of Musk

Lorikeets *(Glossopsitta concinna)*. White Cockatoos *(Kakatoe galerita)* are so numerous in some parts that the ground over a considerable area is quite white. Each morning a flock visited a timber reserve, a square mile in area, and there feasted on the bulbs or corms of the onion-grass *(Romulea)*. Small flocks of Galahs *(Kakatoe roseicapilla)* occasionally visit us, and just before the wheat ripens the Cockatiel *(Leptolophus hollandicus)* come in very large numbers. Crimson Rosellas *(Platycercus elegans)* and Red-backed Parrots *(Psephotus hæmatonotus)* are numerous, and, near the timbered areas, do a great deal of damage to the young wheat. Budgerygahs *(Melopsittacus undulatus)* are found in small flocks.

On one bird trip we were fortunate in discovering in a dry tree-sprout the nest of an Owlet-Nightjar *(Ægotheles cristata)* containing three eggs. As the eggs were within a few days of hatching we several times found the mother covering them. When flushed from the nest she would return in a few mintues. After the young ones hatched out, her behaviour became quite different. She then met us at the entrance to the hollow, and did not return to her young for the rest of the day. She did this for three days, after which we could never find her at home.

Laughing Kookaburras *(Dacelo gigas)* are not numerous except along the river. A pair of Sacred Kingfishers *(Halcyon sanctus)* nested behind our school. One year they did not come, but their place was taken by a pair of Red-backed Kingfishers *(H. pyrrhopygius)*. They drove several tunnels in the sides of the holes made by gold-diggers.

Along the Avoca River, Rainbow-Birds *(Merops ornatus)* are fairly numerous, but further back only odd birds are found. One bird visited us for a few days, and spent its time waylaying bees returning to the hives. In its manner of flight this bird much resembles the Wood-Swallows *(Artamus)*. Spine-tailed Swifts *(Hirundapus caudacutus)* are often seen.

Five species of Cuckoos—the Pallid *(Cuculus pallidus)*, Fan-tailed *(Cacomantis flabelliformis)*, Black-eared *(Owenavis osculans)*, Narrow-billed or Horsfield Bronze *(Chalcites basalis)*, and Shining Bronze *(Lamprococcyx lucidus)* — come to us with the spring. One year they were very numerous, and many bird tragedies resulted. Economically, is is questionable whether the perpetuation of this bird is advisable. The rearing of each young Cuckoo means the death of two, sometimes three, other little birds, birds that are more valuable as insect-destroyers. Black-eared Cuckoos were found as late as the middle of June.

A few Welcome Swallows *(Hirundo neoxena)* stay with us throughout the year. Just before winter came, hundreds of these birds would gather at the northern entrance to the town of St. Arnaud, preparatory to "jumping off" on their northern flight. Dainty Fairy Martins *(Hylochelidon ariel)* build their colonies of bottle-shaped nests under bridges, and beneath overhanging creek banks. "Jacky Winter" *(Micrœca fascinans)* is always a favourite, especially during the winter, when, other bird notes being silent, its song appears to take on an added brightness. It builds a very shallow nest, and it is no wonder that the eggs, generally two in number, and of a pale green colour, marked with purple blotches, are so often rolled out when a strong wind is blowing.

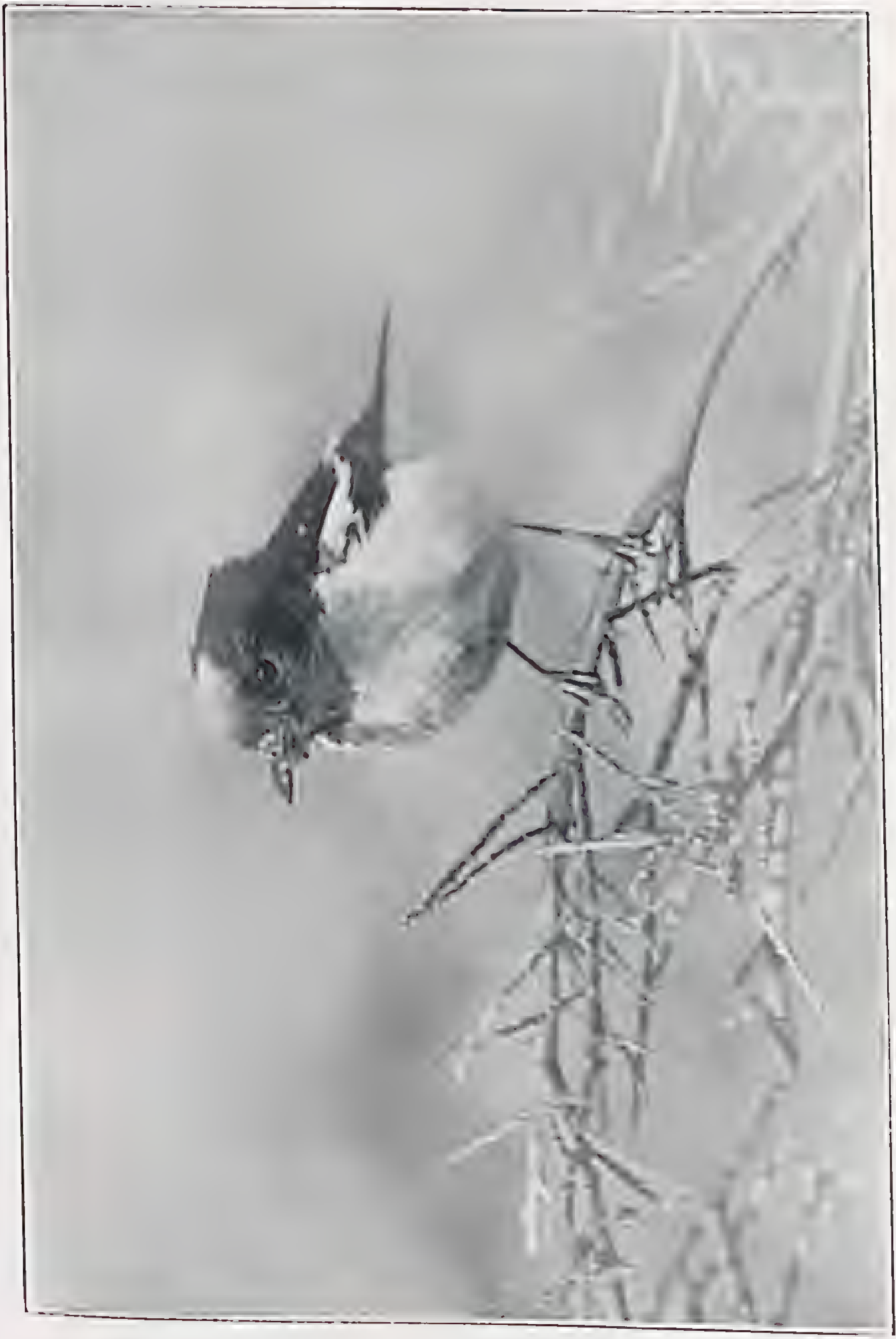
With the approach of winter, Scarlet-breasted Robins *(Petroica multicolor)* arrive, and their vivid red breasts and trusting ways brighten many a cheerless day for the bird-lover. They do not nest with us, but are so tame that photographs may easily be obtained. Flame-breasted Robins *(P. phœnicea)* appear soon after, and move about in small flocks. It is an unforgettable sight to see twenty or more of these birds at twilight flitting like fire-flies from one low stump to another.

The dainty Red-capped Robin *(P. goodenovii)* returns to us in August and September, and loses no time in building its charming little nest. Cup-shaped and made of fine bark, covered with cobweb so skilfully placed on that one might be excused for thinking that it had been spun there by the spider itself, the nest is not much bigger than an egg-cup; and its beauty is enhanced by the working in of soft green moss. So cleverly are the materials blended that it is sometimes difficult to distinguish the nest from the fork in which it rests. The eggs, two or three, are small and beautiful, the ground colour being a very pale green or stone, with brown markings. Two broods are reared in a season. Sometimes two brown birds are found brood-rearing. These are the young ones of the previous year. About the end of December, when brood-rearing generally ceases, these brown males begin to show a ruddy tinge on breast and head. Early in January, the red feathers are still more pronounced.

Hooded Robins *(Melanodryas cucullata)* arrive early in spring, and build their nests on grey, fire-blackened stumps and in the forks of growing trees. The male bird is timid, and the observer has to visit the nest frequently before he will come and feed the young. While his mate is covering the nestlings he assiduously works the paddock for grubs, which he feeds to her. Should an observer be present, he will fly past the nest uttering a sweet call. Like a flash his mate joins him, and, having been fed, returns to the nest. These birds make great use of protective coloration. Two broods are reared, the second clutch leaving the nest about the middle of November.

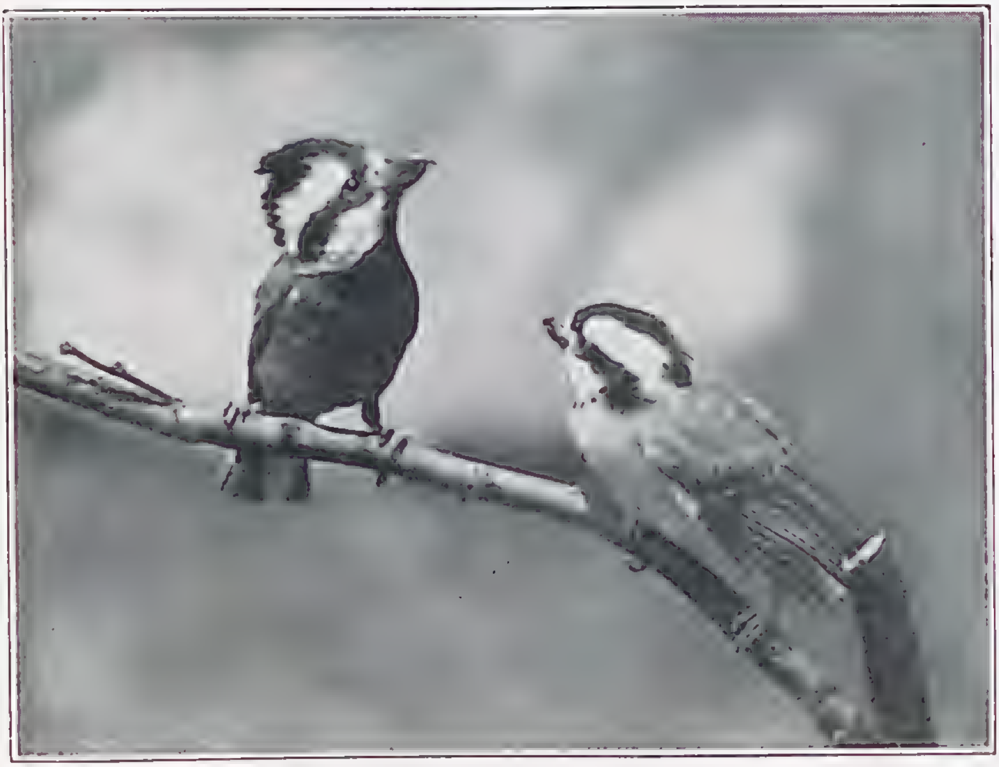
The Western Warbler or Southern Fly-eater *(Gerygone fusca)*—interesting on account of its cleverly-woven nest—is found here in fair numbers.

The Grey Fantail *(Rhipidura flabellifera)* is another early arrival. Its remarkably dainty nest is hard to find. The birds delight in performing all sorts of aerial acrobatic feats. They are very trusting, and will sometimes perch on one's hand.

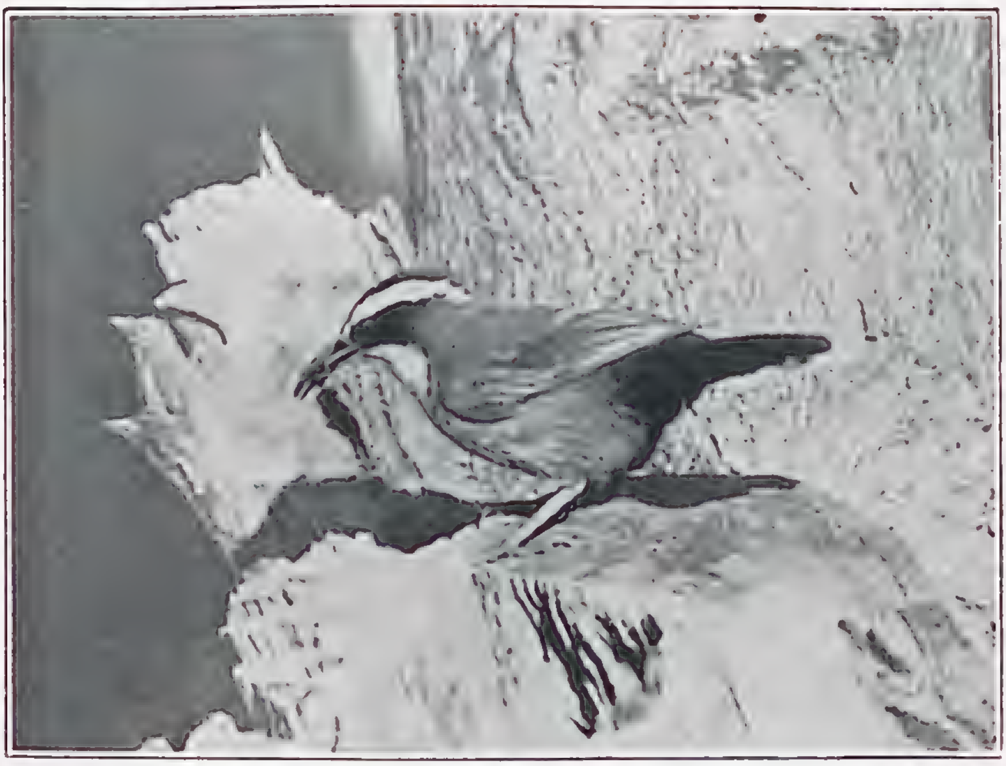


Male Red-capped Robin (*Petroica goodenovii*).

Photo by H. A. C. Leach, R.A.O.U.



Eastern Shrike-Tit and Young *(Falcunculus frontatus).*



White-browed Babbler *(Pomatostomus superciliosus).*

Photos by H. A. C. Leach, R.A.O.U.

During the winter, the song of the "Willie Wagtail" *(R. leucophrys)* is seldom heard, but with the coming of spring the bird appears round our homes, and its "sweet, pretty little cree-ature" denotes that housekeeping will soon commence. "Willie" is very pugnacious, and "afraid o' nothin'." Even human beings cannot overawe this gallant little fellow. I have known a pair of these birds to attack five Crows that were desirous of dining on the nestling Wagtails.

The Restless Flycatcher *(Seisura inquieta)* very much resembles the Willie Wagtail in all stages of its life history. The bird utters its crackling notes when hovering over the grass, and also, on rare occasions, when perched. The excited notes of a pair of these birds one day attracted my attention, and I found that several Crows had just devoured their family of young ones. The distracted parent birds continuously uttered their peculiar notes while in a stationary position.

The Black-faced Cuckoo-Shrike *(Coracina novæ-hollandiæ)* builds high, and its nest of grey bark greatly resembles the almost horizontal fork in which it is placed.

White-winged Trillers *(Lalage tricolor)* arrive in the district in October, and their presence is quickly noted, for the air is filled with their canary-like song, which they utter while on the wing. Male and female differ greatly in colour, but both are beautiful, the former having a pied plumage of black and white, the latter a brown. They lose no time in building their nests, which are usually placed high, but are sometimes found as low as five feet from the ground. The observer has only to stand quite still, and the birds will betray the position of their nest. The selection of a nesting site appears to be decided on in no haphazard manner. I once observed a hen Triller sitting between some forks that were quite bare of nest straws; yet she settled herself between them as if she were in a nest. Then away she flew, and her handsome mate came and set himself in the same place. Evidently the forks were placed at the correct angle, for, three days later, the birds had completed the nest, and decorated the outside with bright "bachelor buttons." The young, two or three in number, are grey in colour. On one bird trip we found a nest low down. The mother bird sat very close, and would not fly off, though the four of us stroked her in turn. Brood-rearing generally stops about the middle of December, and then the birds gradually disappear. Trillers are ground-feeders, and the food given to the young consists mostly of grass-hoppers.

Only once did we find a Spotted Quail-Thrush *(Cinclosoma punctatum)*. We had just captured a young Eastern Shrike-Tit *(Falcunculus frontatus)*, when we "flushed" this beautiful creature. It allowed us to approach quite close and admire it.

Babblers, "Yahoos" or "Hopping Dicks," as they are sometimes called, are birds that have the community spirit well developed. They may be seen moving about in groups of from five to ten; and it is an interesting sight to see them working over a patch of ground. Every piece of bark and small stone capable of concealing a grub is deftly turned over by their strong beaks. Nor is their search confined to the ground, for they collect moths and spiders from the trees. They are noisy birds, and clamorously greet the observer. Two species — the White-browed *(Pomatostomus superciliosus)* and the Grey-crowned *(P. temporalis)*—are found here. They build a large number of nests, only a few of which are used for brood-rearing. This habit stands them in good stead, for very often the "bird-nester" does not trouble to look in all of them. The nests, placed from four to fifteen feet from the ground, are large, and built of sticks. They are roughly oval in shape, with the entrance at or near the top. Quite a lot of dry manure is used, perhaps for germinating heat. The eggs, three or four, are grey, and thickly covered with black cobwebby lines of dried skin. The application of a wet finger causes these lines to disappear. Each pair of White-browed Babblers attends to the feeding of its own young.

On one occasion we visited a nest of a Grey-crowned Babbler, which contained two young birds, one of which was not old enough to be removed. The stronger bird was brought down and placed on a twig, and the camera set up; but the adult birds would not come near, though they could be heard in the adjacent bush answering the calls of the young one. At last one bird arrived, and, a few minutes later, a second. Then others drifted in, until there were eight birds all told. They held a noisy meeting in a near-by tree, evidently debating the situation; then every bird set to work feeding the young one in the nest. They took little notice of the decoy bird, so it was restored to its home. This gorging of the young ones by all the flock explains the long absences of the adult birds from the nest. It would also give the little community time for indulging in their play games, which are varied and interesting. Babblers are mainly ground-feeders. On the Bristol Hill, just to the north of St. Arnaud, may be seen large areas of ground where almost every flat piece of sandstone has its Marchantia-covered surface turned towards the ground.

Songlarks—Brown *(Cinclorhamphus cruralis)* and Rufous *(C. mathewsi)*—are found here; the former mostly in crop paddocks, the latter in timbered grass lands. The nest of the Rufous bird is placed among long grass and clover, and occupies a deep, steep-sided hollow, probably excavated by the birds. The eggs, generally three in number, are heavily covered with reddish-brown markings, darker and more numerous at the broad end. The nest is very hard to locate. The birds arrive in September, and are as much at home in the trees as in the grass. The male bird is very watchful, and, at the first sign of an observer's approach, flies singing from the ground to the near-by trees. The song is very sweet and clear, and of a trilling nature. When young birds are in the nest, the male bird makes use of a musical trill of about five notes. This call is of a ventriloquial nature, and, no matter where the listener moves, it appears to be coming from all sides at once. Out of three families of Song-Larks located in the same paddock, only one survived a spell of unusually hot weather.

In this district, the English Blackbird *(Turdus merula)* is not found in the bush, its habitat being the town gardens. Its song just before dawn is a delight.

White-fronted Chats or Tangs *(Epthianura albifrons)* are numerous, and build in the long grass their nests, lined with horse-hair. Being early builders, they suffer greatly from the attentions of Cuckoos.

Thornbills — Yellow-tailed *(Acanthiza chrysorrhoa)* and Buff-tailed *(A. reguloides)*—are found on the scrub-covered hillsides. One nest of the Yellow-tailed species had two upper rooms; another had the upper chamber warmly feathered, and extending downward until it was side by side with the egg-chamber. If this unusual method of building were resorted to to deceive the Cuckoo into laying its egg in the top nest it failed, for a robust young "bronzie" was successfully reared in the usual chamber. My observations of this bird lead me to think that the top nest is built simply as a resting place for the parent birds when the brood-chamber is filled with well-grown young ones.

The Chestnut-rumped Thornbill *(A. uropygialis)* is a dainty little creature, clad in sober-colored plumage, the beauty of which has to be seen at close quarters to be fully appreciated. It nests in old stumps. It is a remarkably tame little bird, and may easily be induced to perch on one's finger. The food given to its young consists of tiny grubs and small white moths.

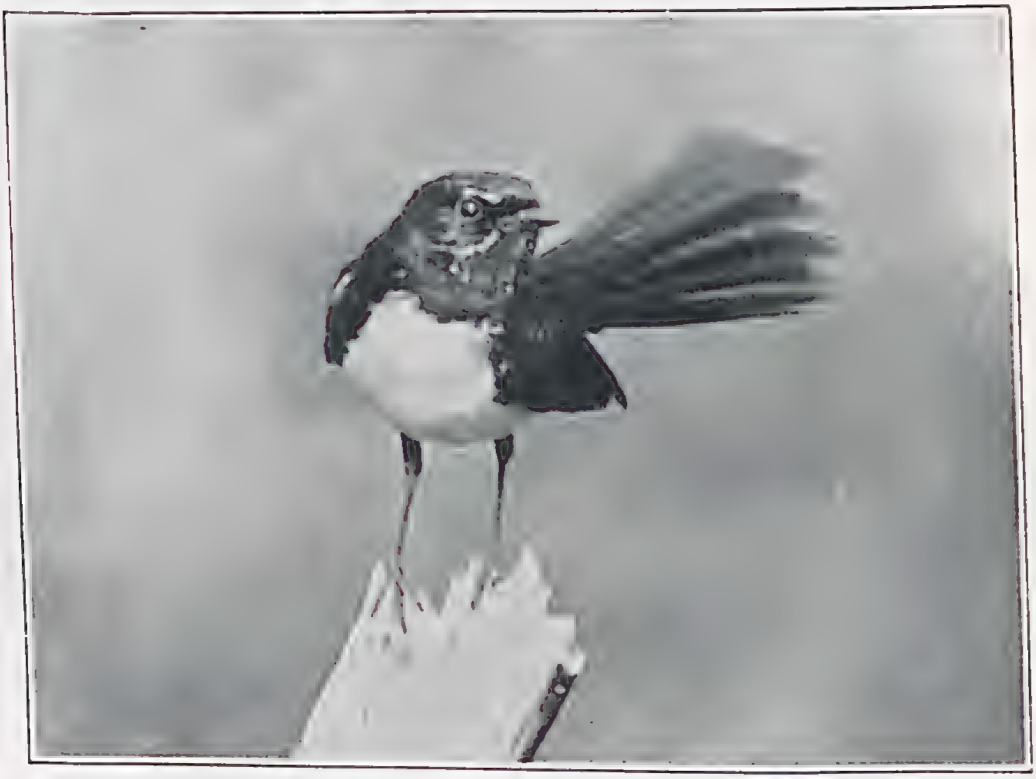
Vivacious Superb Blue Wrens *(Malurus cyaneus)* build in the box-thorn hedges, and in the long grass bordering a creek.

The White-browed Wood-Swallows *(Artamus superciliosus)* usually return to us in November; but, as was the case in 1921, they have come as late as the end of December or at other times as early as September. The September birds commenced building straight away, and the first young one appeared sixteen days after the birds' arrival. Their food consists of flying insects and grasshoppers. The latter is a favourite item on the menu for the young. They are also fond of bees. One year they were particularly hard on my hives, perching on the near-by posts, and from there swooping on their nectar-laden prey. Masked Wood-Swallows *(A. personata)* usually arrived with the White-browed birds.

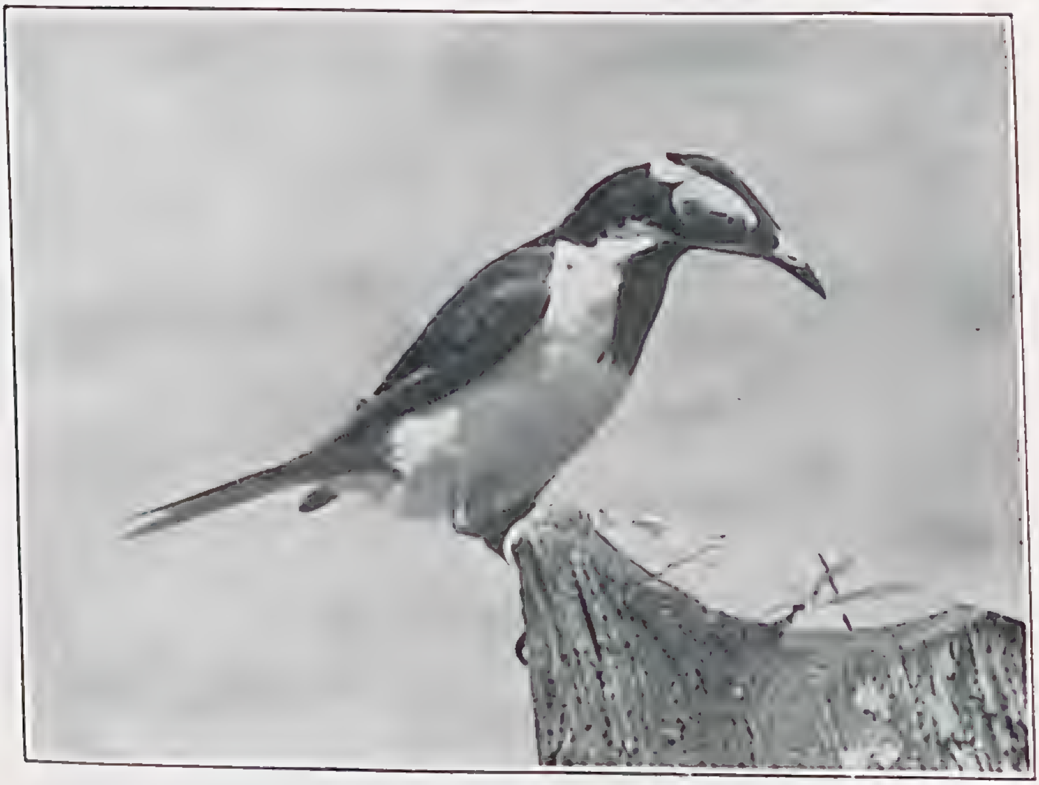
The Dusky Wood-Swallows *(A. cyanopterus)* generally stay with us all the year, though sometimes they disappear for a couple of months, reappearing about September. This Wood-Swallow is a bold bird, and will continually swoop at an intruder. Its angry cries bring others to the spot, and it is a common sight to see half a dozen of them attentively watching from the branches above, swinging their tails from side to side, and clearly calling "Tit Willow! Tit Willow!" These birds sometimes kill their young if the nest is visited too often. Their food is varied. I once found the tail portion of a "barracoota mudeye"—the larva of a dragon fly—protruding from a fledgling's beak.

A few Magpie-Larks *(Grallina cyanoleuca)* stay with us all the year. In July, 1922, a flock of twenty-three arrived, and for a few days continued flying round our house. They then disappeared. On the 20th of September, a single male bird was found in our yard. He bore signs of having come a long way, being lame and deformed in one leg, slim of body and ravenous for food. So tame was he that we could "shepherd" him anywhere. A pair of local birds called to him, but the only notice he took was to send forth a clarion note of defiance. For an hour or more he hunted food; then disappeared. Probably he belonged to the flock referred to above, but his injured leg prevented him from keeping up with them on their long "trek" southwards. Five months later—17th February—this bird returned to our yard, and was easily recognised by his injured foot. He was in splendid plumage, and plump condition, and had an equally handsome mate. They stayed two days, and then left for their winter quarters. Does this experience tend to prove that these birds come from and return to their winter quarters by the same route?

On account of its beautiful song and trusting ways, the Grey or Harmonious Shrike-Thrush *(Colluricincla harmonica)* is a great favourite. This bird is always with us, and its notes become subdued and plaintive as the autumn merges into winter. With the approach of spring, the birds burst again into full-throated melody, and early and late intensify the charm of the woodland. The Shrike-Thrush builds low. Its open nest is a beautiful structure of soft bark, lined with roots. The site varies. The bird is a lover of dark places, and most often the nest is placed in the forks of a "sucker," the leafy outgrowths of which provide splendid shade. But the nest is also placed in rather odd places—a ledge of rock in a quarry, the wall of a mine shaft, in the deserted nest of a Babbler, and one was even found in an old paint pot standing in a little used shed. In the St. Arnaud district were a few Shrike-Thrushes that I always thought were of a different species from the Harmonious. These birds were larger and greyer; their song was similar, but fuller; and their eggs a little larger. Thrushes suffer greatly from Crows, and from domestic cats that have "gone bush." As a rule, these birds do not welcome visitors to their nurseries, and will, on slight provocation, throw their offspring out of the nest. Their "bill of fare" has a wide range. Last week I saw one breakfasting on the "woolly" aphis of the apple trees.



Willie-Wagtail *(Rhipidura leucophrys).*



Blue-faced Honeyeater *(Entomyzon cyanotis).*

Photos by H. A. C. Leach, R.A.O.U.

Our bush contains a wonderful variety of birds, and it is difficult to determine which of them is the greatest favourite with bird-lovers. The Australian Magpies have taken the popular fancy, and deservedly so. When the morning star hangs low in the sky, and when the bush is enfolded in the dim, eerie light that precedes the dawn, the glorious melody of this bird *(Gymnorhina tibicen)* is heard to great advantage. Softly and sweetly come the liquid notes in perfect sympathy with the mysterious feeling pervading the bush at that hour. Then a "swish-swish-swish" of invisible wings tells the listener that the birds are on the move; and, as the light grows stronger, their forms are silhouetted overhead as they leave the shelter of the trees for the open country. In this district the birds are of the black-backed variety, but sometimes a white-backed bird *(G. hypoleuca)* is seen. Occasionally a white-back mates with a black-back, the young ones being of each kind. The districts inhabited by these birds appear to be divided into zones, certain zones being relegated to a certain group of birds; and there is always trouble when birds from one zone invade the hunting grounds of others. Should a Hawk appear in the sky the nearest Magpies rise and pursue it to their boundary. Their fierce cries bring the next pair of birds into the chase, and they, in their turn, drive the marauder still further away, until he disappears in the distance. Why do some people cage this Caruso of the bird-world, and condemn it for life to use its glorious voice in calling out some common ditty, when, if allowed its birthright, it would, from some wind-blown bough, regale the countryside with the wild, untrammelled, and indescribable beauty of its native song? Fierce and pugnacious as is the Magpie, he does not always have his own way. On one of my early morning fox-hunting trips, I was occupying a position commanding a view of a long, gently-sloping valley leading to the hills. In the dim light the dark form of a Magpie winged silently overhead. Just as silently another dark form—that of a fairly large Hawk—followed and attached itself to the first, and, with four wings working apparently from the one body, the dark mass came to earth, the only sound being a few startled squawks from "Maggie" when the attacker established contact. Fortunately for the victim the impact with the ground loosened the aggressor's grip, and the birds, falling apart, quickly disappeared in different directions. During the days preceding nest-building, Magpies sing long and often; but, when the young ones appear, they are kept far too busy attending to them. They are also comparatively silent during the summer months.

The rollicking songs of Grey Butcher-Birds *(Cracticus torquatus)* are heard to great advantage in late winter and early spring. The birds are very fierce in defence of their eggs and young. On two occasions I located a Butcher-Bird's "pantry," and found in each case a small bird of the Thornbill variety suspended by a thorn through the "gills." The bird is a source of trouble to canary owners. Perching on the outside of the cage it exercises a mesmeric influence on the terrified inmate, until the latter flutters within reach of the cruel, curved beak. One stab, and a bundle of golden feathers lies at the bottom of the cage.

Odd pairs of Eastern Shrike-Tits *(Falcunculus frontatus)* are met with in the timber. The grey-green back and the bright yellow of the breast and under parts, as well as the black head with its broad lines of white above and below the eyes make this bird very conspicuous; but its most noticeable feature is a black crest, which the bird raises and lowers at will. A short but very stout bill, slightly hooked at the end, is a particularly efficient implement for tearing away the bark under which the bird obtains its principal forms of food. While engaged in this work it keeps up an incessant chattering, at times breaking off into a piping call on the one note. The young are marked similarly to the parent birds, though, when just out of the nest, the back is of a fawn colour, with a few green feathers showing, and the yellow of the breast is not so strong. Though always on the look-out for this bird's nest, we could not succeed in finding one; but, fortunately, we one day came upon a young bird that, for some reason or other, was not able to fly well. It served as an introduction to the parents. For four days we had delightful intercourse with these birds, each succeeding day locating the young one by imitating its piping note. The little lady was a clever ventriloquist, and delighted in sending us in various directions for quite a long time. The food fed to the young bird consisted solely of fat, pink borer-grubs, obtained from the neighbouring trees. The grub was always carried lengthwise in the beak, and, even at close range, was hardly visible.

Crested Bell-Birds *(Oreoica gutturalis)*, remarkable alike for their ventriloquial notes and for their habit of keeping live caterpillars in their nests, are fairly numerous. The bird's song is not so varied as that of the Shrike-Thrush, but the notes are full and sweet, the last note particularly so. The words, "Tip-tip-tip-tip—top o' the Wattle," suit the call perfectly. The bird renders the words on a top note, on the last syllable of "wattle," dropping to a note which reminds the listener of the falling of a stone into a deep pool. The effect is charming, monotony being avoided by the bird's pitching its call first from one direction, then from another; now from high up in the tree, now from low down; until the listener is quite bewildered as to where the bird really is. The notes of the song not only vary in pitch, but also in number and in time. Generally the favourite numbers are five and nine; but frequently intervening numbers are heard. Sometimes the bird calls only two very musical notes, corresponding to the "wattle" of the full song. The ordinary call of this Bell-Bird is delightful, but on special occasions the bird lays itself out to show just what a wonderful artist it is. Twice I have been privileged not only to listen to such a recital, but to have the bird in view at the same time. The soft notes, which to the listener appear to be far away, are uttered while the bird's head is held in a horizontal position, with the beak slightly open. As the beak is opened wider, and the head thrown further back, the song increases in intensity, and in seeming nearness, until the very air is pulsating in throbbing accord with the rapturous exultation of the ardent songster; then, sudden silence. After a brief period the soft notes recommence, and the performer, in almost imperceptible gradations, once more transports his offering from the distant hillside, and lays it at the listener's feet. The nest is similar to, but shallower than, that of the Shrike-Thrush, and is generally placed in the forks of a "sucker." An interesting feature of this bird's nest is the presence therein of live caterpillars. These "processional caterpillars," brown and hairy, are known as the "bush silkworm," and are placed in the nest before the eggs are laid. In one nest I counted fourteen caterpillars. Some lay at the bottom of the nest, and others were continually moving round the rim. The eggs, two or three, and about an inch in length, are white, with black spots. Seeds form a part of the food of these birds. This explains their habit of frequenting roads, where seeds may be gleaned. Like the Shrike-Thrush they desert their nest on slight provocation.

Golden- and Rufous-breasted Whistlers *(Pachycephala pectoralis* and *P. rufiventris)* nest here from September to December. So timid are the birds that they often desert a nest soon after it has been discovered. Any loud noise—the discharge of a gun or the falling of a tree—causes the male to burst into song, finishing with "jo-ee, jo-ee" repeated *ad lib.* When the young birds have left the nest, the male parent is full of the joy of living. He pulsates with excitement, and may be seen fairly dancing as he floods the woodland with his musical notes.

The Southern Yellow Robin *(Eopsaltria australis)* builds low, sometimes only a foot from the ground. The young resemble the young of the Hooded Robin, but are browner. Sometimes a dark-coloured young one is found. When about two months old they begin to get the yellow breast-feathers. Two broods are reared in a season.

Eastern White-faces *(Aphelocephala leucopsis)* are numerous, and nest in hollow stumps. The eggs are almost replicas in miniature of the eggs of the Tree-Creeper.

One November I saw some Black-capped Sittellas *(Neositta pileata)* working some very high trees. Generally they proceed in just the opposite way to that of Tree-Creepers, moving from the top downwards, though they frequently work up a branch. The speed with which they work is remarkable. When searching a branch inclining upward, they go with less speed, and seem to move sideways. Having reached the end of a limb, they drop with wonderful speed to the branch below, and work rapidly downward. All the time they are hunting their food they keep up an incessant chattering.

Brown Tree-Creepers (*Climacteris picumnus*) are quite common. I do not regard the orange bands under the wing as "warning colours." The bird has an alarm call, and when surprised never fails to utter it. Again, the orange bands show when the bird is following its usual avocation of searching for insects. How, then, are the other birds to decide whether there is an enemy about or not? In fairly thick timber, interspersed with suckers, it would be very difficult for other birds to view these wing patches, supposing the owner were making for cover. Even the movement of a rabbit through the undergrowth will cause this bird to utter its alarm-signal. The White-winged Chough is another bird possessing what might be termed "warning colours." Here, again, we find that the bird uses an alarm call. The nest of this Tree-Creeper is cup-shaped, and placed low down in tree-hollows or hollow stumps, the material used being rabbit fur or cow hair, with wool for the lining. The eggs, two to four, are white, and heavily marked with red. The young are black, and have yellow beaks. Tree-Creepers nest here from August to the end of November.

Grey-backed Silver-eyes *(Zosterops halmaturina)* are found in fairly large numbers. They are very fond of soft fruits, such as the fig; but, during the winter months, they make partial amends by cleaning up the aphis insects on rose bushes and fruit trees.

Beautiful Pardalotes *(Pardalotus)*—Red-tipped, Spotted and Yellow-rumped—make their tunnels in creek banks and in the sides of old digger-holes.

The Honeyeater family *(Meliphagidae)* is well represented. The Black-chinned *(Melithreptus gularis)* builds high, sometimes among the topmost twigs of a big eucalypt, and so the nest is difficult to locate. It is finely-woven, and similar to that of the White-plumed Honeyeater. The young are fawn-coloured. Black-chins stay with us all the year, and their clear, ringing call may be heard at some distance. They may frequently be seen clinging to the side of a cow, and pulling out the short, soft hair lying close to the skin.

Brown-headed Honeyeaters *(M. brevirostris)* are numerous. We once found a nest turned upside down by a storm. The three young ones were clinging desperately to the fabric of their little cradle. We removed them from their precarious position, and placed them and the remnants of their nest in a small cardboard box, which was fastened low down in the sapling. The parents accepted their new home without demur, and tended their young therein for five days. Often other Brown-heads helped in the work. Much of the food fed to the young consisted of tiny pieces of the chrysalis cases of a species of small caterpillar that joins together a pair of eucalypt leaves by means of fine gossamer threads. Many small birds use this food for their young. Before feeding their offspring, the Brown-heads often engage in play.

Regent Honeyeaters *(Zanthomiza phrygia)* are rare visitors to the St. Arnaud district, having come only twice in twelve years. In July of 1924 quite a number arrived. The local Honeyeaters resented their presence, and, for several days, chased them from tree to tree; but they were not to be ousted, and in August set about building their nests of bark in the upright forks of saplings, and in projecting pieces of bark. After rearing one clutch of young ones, they disappeared.

The Fuscous Honeyeater *(Meliphaga fusca)* is found in large numbers. Its nest rivals that of the White-plumed bird in its perfect weaving. It and the Yellow-tufted Honeyeater *(M. melanops)* stay with us all the year. The latter commences nest-building in August. It is a handsome bird, and its plumage, though showy, blends so well with the blues, greens and browns of the "sucker" leaves that it is sometimes difficult to discern it as it steals through the foliage to visit its young. It is very pugnacious, and makes a great fuss when a person approaches its nest of young. Uttering piteous cries, which soon bring half a dozen or more of its companions on the scene, it flutters along the ground, sometimes picking up and dropping again small sticks and pebbles as it moves along. Though these birds live on nectar when it is to be obtained, they display agility equal to that of the Flycatchers in capturing flying insects.

Another very rare visitor is the Helmeted Honeyeater *(M. cassidix)*, but White-plumed Honeyeaters *(M. penicillata)* are fairly numerous.

The Noisy Miner *(Myzantha melanocephala)*, or "mickie," as he is generally termed, is common everywhere. On account of his friendly ways, he is a favourite with bird-lovers; though he is disliked by the sportsman, for he rarely fails to proclaim that person's presence when he enters a paddock in search of game. He sometimes makes amends by advertising the track taken by a fox that has "winded" the hunters. The sight of a snake will arouse these birds to a great pitch of excitement, and, for this reason, country dwellers are glad to have them around their homes. They commence nest-building in July or August, and their neat, cup-shaped nests, lined with wool or horeshair, are placed from seven to sixteen feet from the ground. Birds that live about people's homes quickly become very tame. We had five "mickies" that came daily for food, which they took out of our hands. They even came into the house and regaled themselves with sugar and butter. One was especially tame, coming from the trees when called. She often accompanied me to and from my school. Generally, these birds agree among themselves very well, but at the commencement of the nesting season they quarrel long and often. We sometimes saw a pair locked together rolling over and over on the ground.

One day, two of them, evidently disputing over a lady, fell from the top branches of a eucalypt to the ground, where they fought savagely; the female bird hopping round them like a referee. So engrossed were they all that I walked up and caught both combatants. However, their family quarrels are dropped when a common danger threatens. One Saturday, when returning from a shooting trip, our attention was drawn to several "mickies" that kept continually swooping at a certain spot on the ground. On our near approach we found that a small Hawk had a "mickie" pinned down, and was making the feathers fly to some purpose, nor did he desist as we approached. Only when the gun was lifted up did he fly away, and even then he attempted to carry his prey with him, but its weight compelled him to let go, and his intended victim, half plucked, lost no time in reaching the shelter of a tree.

Red Wattle-Birds *(Anthochæra carunculata)* are numerous in the timber on the hills. They are very shy. Their timidity is doubtless the result of the too-frequent attention given to them by "pot hunters," for this bird has the reputation of being "the best eating bird in the bush."

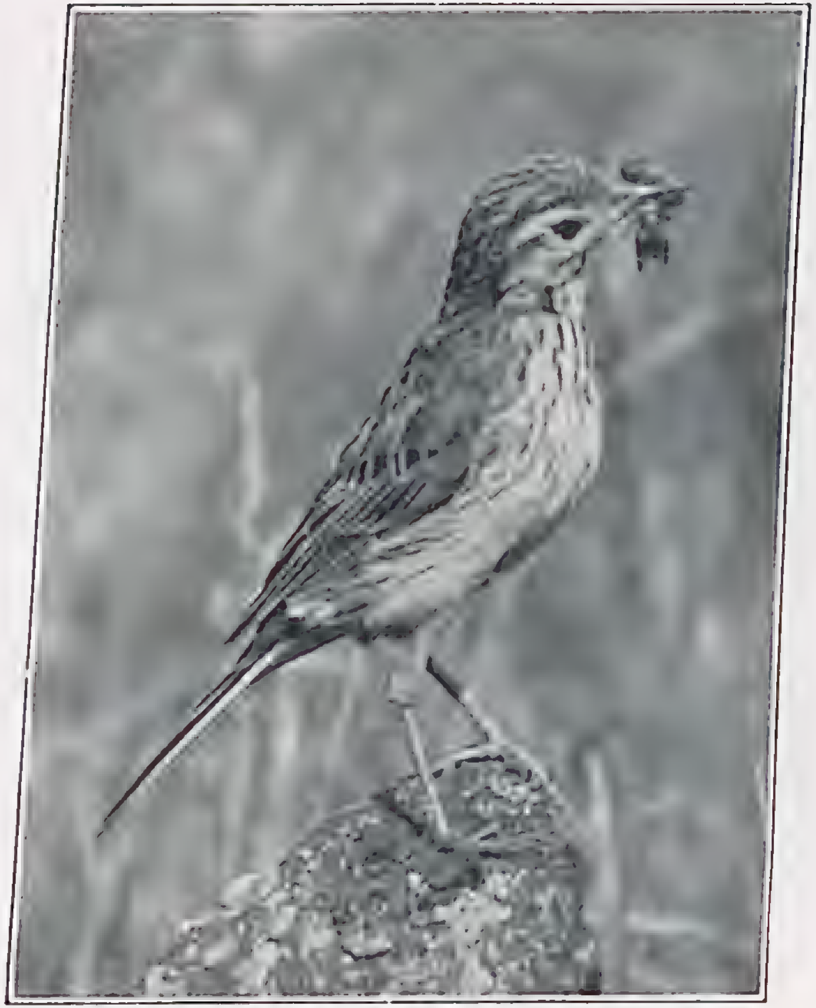
About four years ago a pair of beautiful Blue-faced Honeyeaters *(Entomyzon cyanotis)* came to our district. After a while they chummed up with our tame "mickies," and by them were initiated into the "easy" life—the obtaining of a good proportion of their food from our and our neighbour's yards. We had them and their two young ones as daily visitors, and it was a common sight to see the four of them perched on a small table at our back door partaking of honey. We took several photographs of these beautiful creatures. Their strong, pointed beaks enable them to dig out borer grubs from under the green bark. They generally built in a deserted Babbler's nest.

Ground-Larks or Pipits *(Anthus australis)* are numerous, but their nests are so skilfully hidden that, unless the sitting bird is "flushed," they are seldom discovered.

Greenfinches *(Ligurinus chloris)* are found in the town gardens. Goldfinches *(Carduelis carduelis)* return just before the orchard trees are bursting into bloom. They commence building their pretty, cup-shaped nests in apple and pear trees, just after the buds have burst, and later the nest is almost completely hidden by the growing leaves. They also favour quince trees, and the woolly nest, with its pretty eggs, placed in a setting of bright leaves, makes a beautiful picture. House-Sparrows *(Passer domesticus)*, of course, are in great numbers. Diamond Firetails *(Zonæginthus guttatus)* and Red-browed Firetails *(Ægintha temporalis)* are fairly numerous. Starlings *(Sturnus vulgaris)* nest in the dead timber.

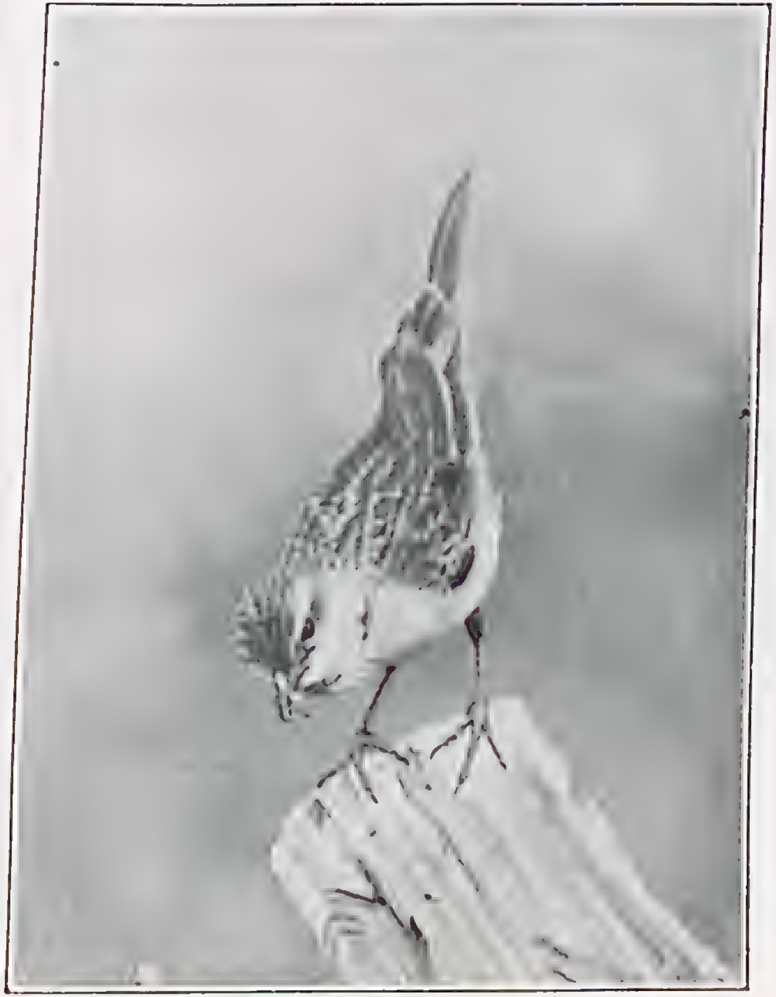
The beautiful Olive-backed Oriole *(Oriolus sagittatus)* is a rare visitor. Its suspended wool-lined nest much resembles that of a Honeyeater, but is larger. The eggs are white, with brown blotches, and are about the size of Shrike-Thrush's eggs. The

PLATE 26



Australian Pipit *(Anthus australis)*,
with insect in bill.

Photo by H. A. C. Leach, R.A.O.U.



Rufous Song-Lark (*Cinclorhamphus mathewsi*).

Photo by Master J. N. Leach.

birds utter a pleasing call that sounds like "or-ee-ee, or-ee-ee." They resent inspection of the nest, and utter angry cries, while perched in the trees close by. Then in a kind of "glide" they dash with great speed right at one's face.

Crows or Ravens *(Corvus)* are sometimes met with in large numbers. They levy toll on lambing ewes that have had the misfortune to get "down" on sloping ground. Their method of attack—the picking out of an eye—is particularly cruel.

White-winged Choughs *(Corcorax melanorhamphus)* are found among the tall timber. They are often shot at and so are hard to approach. In my present district (Barker's Creek) we have a flock of fifty or more that visit our school-ground daily, and so we have been able to study them at close quarters. We find that a great portion of their food consists of beetles, which they dig from under the pine trees, and of termites or white ants, which they get around dead stumps. They also feed on the bulbs of the onion-grass. They appear to be very fond of each other, and, when feeding together, a cry from a fully grown bird will cause another immediately to rush up and place food in the former's mouth. All the birds help in building the large mud nests, and, while the eggs are being incubated by the real owner, the flock feeds close by, keeping a careful watch for marauding Crows. They are just as fond of play as are the Babblers, "follow the leader" being a favourite pastime. Sometimes one bird will seize hold of a small stick, and, throwing himself down will resist the attempts of the others to get it from him. Again, a bird will catch hold of a bunch of leaves trailing on the ground, and drag it round and round.

A Tame Bronze-Cuckoo.—When I was a lad I attempted to make a pet of one of these birds, and with no small amount of success. The little chap showed no fear of humans, and was quite satisfied to accept me as his feeder, but what an appetite. My father was an orchardist before the days of spraying for codlin moths. At that time we used to tie a bandage round the trunk of the apple trees to trap the grub after its work had been finished, and the number of grubs caught was enormous. Well, the bandage solved the problem of Cuckoo food. I used to take the little bird to the tree, and release the bandage, and it simply collected its own food. I still have a very vivid recollection of that little bird eating over 300 grubs for one meal —about 250 to 280 was its average meal. The Cuckoo became very quiet, and would never attempt to fly away. I kept it caged only for about two or three weeks, but it never left the house for about three months. It used to fly about the orchard wherever I was, and simply asked me to untie a bandage. It disappeared one day, probably responding to a call from Nature, and I never saw it again.—SYDNEY J. LUGG, Moolap, via Geelong.

A Visit to Taranga, Hen and Chickens Group (N.Z.).

By Mrs. PERRINE MONCRIEFF, R.A.O.U., The Cliffs, Nelson, N.Z.

On December 2nd, 1927, together with Miss McArthur and Mr. A. Pycroft, the writer proceeded to Taranga. To Mr. Pycroft the expedition was especially interesting, seeing that he was re-visiting the island after twenty-four years' absence; thus he would be able to ascertain the changes which had taken place during the interval between his first and second visits.

Taranga, the largest of a group of islands, known as the "Hen and Chickens" (so named by Captain Cook), lies east of New Zealand, thirty miles from the town of Whangarei, in the north island. It is seventy miles N.N.W. of Auckland, thirty miles from the Poor Knights, and twenty-five miles from the Little Barrier, two other interesting bird resorts. These islands are under the supervision of Mr. W. M. Fraser, Honorary Curator, who landed us on Taranga, after a Government permit had been obtained.

Taranga lies four miles south of the Chickens, large islands themselves, inhabited by many Bellbirds, Tuis, Pigeons, and Parrakeets. It is nothing more than a steep mountain top, protruding from the bed of the ocean, and rising to 1300 feet in the centre, in picturesque peaks, up which hardy bush, chiefly composed of pohutukawa, grows, almost to the summit, The latter tree is found from a few feet above high-water mark, up to the summit of the island.

Owing to the steep gradient, it is difficult to pass from one side of the island to the other carrying any supplies or equipment. The northern and eastern portions of Taranga, being most exposed, are covered with low thick scrub; in gullies, and, wherever there is fairly level ground, rich luxuriant growth is to be found; as on the western and southern portions of the island.

Our camping site had to be decided by the proximity of water, and though we first landed in a bay on the northern side, we were finally deposited on the western portion of Taranga. The weather did not permit our landing either in the south (where the Austrian scientist, Reischek, lived alone with his dog for three weeks in 1880); or in the south-west, where Mr. Pycroft had been deposited beneath a shaggery, in the early hours of the morning in 1903.

This paper, therefore, deals entirely with birds seen in the western, and part of the southern portion of Taranga (whither we penetrated by foot); or with those observed during a very brief visit to the north.

The total area of the island is 1175 acres, of which we explored only about 600 acres. A girdle of flax and manuka encircles the island in most places, but once this is surmounted, it is quite easy to traverse the open bush, wherein lordly trees grow, such as puriri, pohutukawa, kohekohe, rewarewa, taraire, and tawa.

The floor is extremely rocky, with usually a very shallow sub-strata, covered with ferns (*Asplenium flaccidum*). In some places nikau palms are growing, but do not appear to attain a great height.

Everywhere enormous boulders lie, which must have fallen from the mountain top; these are covered with creepers and trees, and seem favourite nesting sites for birds.

We spent the majority of our time searching the open bush, but also patrolled the shore, and twice ascended to the summit of the island.

It was during one of these expeditions that we were disgusted to find traces of the Norwegian Rat (*Rat rattus*) almost up to the summit. We had at first hoped that there were only a pair round our camp, but as time went on, realised that they had spread throughout the island.

These and Starlings were two innovations since Mr. Pycroft's first visit to Taranga, and the writer looks with great concern at the appearance of these two pests on this interesting bird sanctuary.

At present the latter are not an actual danger, being too small in numbers, but when these birds increase, they may compete with other similar birds for food and nesting holes.

As far as he could judge, without returning to the site of his original camp, Mr. Pycroft was rather of the opinion that there were fewer Petrels on the island. He states:—"I was formerly on the island in September and October. They were then cleaning out their burrows. We may have not been there when they were most numerous, or too late for some."

An interesting feature of our visit was the chorus of bird song, every morning, and the writer gives the following table of the hours at which each species of bird began to sing:—

2 a.m.—Only Petrels heard calling.

2.30 a.m.—An old Tui would start "kluk, kluk" amidst the clamour of the Petrels.

Shortly afterwards, the air was full of melody made by Tuis and Bellbirds, reinforced very soon afterwards by the Song Thrush.

On their footsteps followed White-eyes. Other birds joined in later.

In compiling this paper, the writer would like to acknowledge her indebtedness to Messrs. A. Pycroft, R. Falla, and

W. M. Fraser for information supplied. Especially to the latter, for the numerous efforts he made to take the party off Taranga when the weather proved inclement.

To reach Taranga, we launched down river from Whangarei to the heads, then across the open sea for fifteen miles. The following is a record of birds observed before reaching Taranga:—

Eudyptula minor. Little Penguin. — Several observed swimming round the launch in the open sea.

Puffinus gavia. Fluttering Shearwater. — These were seen flying over the water about the vicinity of the Chicken Islands. "A breeding place of these birds is on Bream Island, just off Bream Head." (Falla).

Puffinus griseus. Sooty Shearwater; or, more likely, **Puffinus carneipes,** Fleshy-footed Shearwater.—Fishing in the surf off the ocean beaches, three in number, outside Whangarei Heads.

Puffinus bulleri. The Long-tailed Shearwater.—One ashy-backed Shearwater sighted by Mr. W. M. Fraser near the Chicken Islands.

Pterodroma lessoni. White-headed Petrel.—On returning to Whangarei, on December 18th, the writer saw two birds on the water inside Whangarei Heads; the one was dark throughout like *Puffinus griseus,* the other exactly the same except for a white head. Query, whether the above species.

Pelecanoides urinatrix. Diving Petrel.—One of these small birds swam past the launch in the open sea.

Phalacrocorax varius. Pied Cormorant.—In the river, fishing.

Hydroprogne caspia. Caspian Tern.—At the mouth of the river.

Sterna striata. White-fronted Tern.—Sunning themselves on the sandy ocean beaches in large numbers, from thirty to forty.

Limosa lapponica. Bar-tailed Godwit.—A small number of these birds were observed feeding on sand spits up the river.

Demigretta sacra. Reef Heron.—Three pairs had nested on Aubrey's Island, within Whangarei Heads; the young were fully fledged.

The following list of plants and trees growing on Taranga is given, amongst which the birds live and find their food. All the trees are very plentiful on the mainland, except those asterisked:—

Cabbage Tree (*Cordyline australis*), Pohutukawa (*Metrosideros tomentosa*), Kohekohe (*Dysoxylum spectabile*), *Whau (*Entelea arborescens*), Manuka (*Leptospermum scoparium*), Manuka Rauriki (*L. ericoides*), Mahoe (*Melicytus ramiflorus*), *Puka (*Meryta sinclairii*), Rewarewa (*Knightia excelsa*), Karaka (*Corynocarpus laevigata*), Veronica, Rangiora (*Brachyglottis repanda*), Taraire (*Beilschmiedia tarairi*), Puriri (*Vitex lucens*), Tawa (*Beilschmiedia tawa*), Nikau (*Rhopalostylis sapida*), Flax (*Phormium tenax*), Rock Lily, Astelia (*Astelia Cunninghamii*), Native Celery (*Apium prostratum*), Mapau (*Myrsine Urvillei*), Toi (*Arundo conspicua*),*Parapara (*Pisonia Brunoniana*), Bracken.

The following is a list of the species of birds seen on Taranga between December 2nd and December 18th, 1927:—

Eudyptula minor. Little Penguin. — These birds come ashore in numbers on Taranga to nest. Everywhere their worn tracks are to be seen leading from the sea, up incredibly steep inclines, over rocks, and through bracken to their holes. On December 4th, two Penguins

Where the White-fronted Terns nest.

Where the Petrels have their burrows.

Photos communicated by Mrs. P. Moncrieff, R.A.O.U.

NATIONAL L [illegible] VICTORIA

walked past our tent at night, and on December 9th, at 9 p.m., we secured one, and brought it into the tent. Unlike the gentle Petrels, it snapped at us, and tried to peck viciously. When released, it ran half-upright round the tent seeking an exit. Penguins suffer severely during rough weather, for if they get within the surf inshore, they are pounded to death on the rocks. During our brief visit, we found two or three which had died in this manner. Mr. Pycroft obtained an egg, which had been abandoned, from beneath a massive rock, where Penguins had been nesting. In appearance, the egg had an opaque shell, and was rounder than that of a Petrel. Size, 2in. x 1½in.

Hemiphaga novæ-seelandiæ. New Zealand Pigeon.—There birds are not so numerous as one would expect, neither are they as tame. Usually, when approached, they flew up, leading one to suppose that they had come over from the mainland, where they had been fired upon. Occasionally we surprised Pigeons feeding on the fruit of the puriri, and at sunset we often saw them flying to and fro beneath the rocky peaks, which they frequented. One nest, with the bird sitting very close, was built in a cradle formed by vine (query, whether clematis) about 12-14ft. up, in a small kohekohe tree, beneath pohutukawas, on the slope of cliff above the shore. A second nest was in a clump of astelia, from which the Pigeon flew at our approach, revealing one egg, which was photographed. Size, 1⅞in. x 1¼in. A third nest was found during our descent from the mountain peaks, also built in a cradle of vine. The bird quitted its post at our approach, and we were unable to ascertain which was the proper nest from the several attempts at nest building, all about 12ft. from the ground, one more flimsy than the other. Had we not surprised the Pigeon sitting, we would never have believed that one of these frail structures, composed of a few sticks, was being used as a nest. A Pigeon's nest is well known to be somewhat airily built, but neither Mr. Pycroft nor myself had seen before anything quite so jerry built.

Puffinus griseus. Sooty Shearwater.—In correspondence with the writer, Mr. R. Falla, who is familiar with Petrels in these waters, states:—"From my own investigations on the 'Chickens,' I should put down *Puffinus carneipes* as the predominant breeding species in the area (although it may not be so on the 'Hen'). So few specimens of *Puffinus griseus* are seen at sea in that locality, and so many *Puffinus carneipes*, that I would suppose the latter to be much more numerous on the 'Chickens' than *Puffinus griseus* on the 'Hen.'" And suggests that there are only isolated groups of a few burrows.

Under the circumstances, the writer is rather dubious of making a statement of the number of *Puffinus griseus* existing on the "Hen," seeing that she is not well acquainted with sea-birds of the North Island. More especially when it is almost impossible to recognise Petrels when they come home to their burrows in the half-light of the closing day.

The writer, however, was able to handle two specimens, and identified them as *Puffinus griseus;* the first Mutton-bird having been washed up on the beach, the second being found swinging by the neck from a karaka tree. On both occasions, the writer took care to note the colour of the beak and legs, also to observe the whitish area of the under-wing coverts.

It was to this bird that we ascribed the weird, disjointed, jerky cry heard most evenings, though it has been suggested, as being more probably *Pterodroma inexpectata,* the Mottled Petrel. Bird cries are invariably difficult to convey to a reader who has not made the acquaintance of the particular species referred to, but Mr. Pycroft's rendering, written twenty-four years ago, when first heard, gives an excellent idea of the sound: "Aho, Aho, Aho, Aha, Aha, Aha, Ahe, Ahe, Ahe" (uttered very rapidly, and ending with a shriek). To the writer it gave the impression of a train accelerating in speed going downhill. Some nights the noise was very marked, especially towards the early hours of the morning, when the Petrels were leaving to go out to sea. Other nights everything was comparatively quiet; which rather suggests the possibility that they fail to return inland when weather has been against their fishing. On December 14th, the sea was very rough, and the following is an extract from the writer's diary:—"Sea rough, Petrels circling over the waves in great numbers; very few heard during night."

Puffinus gavia (?). Fluttering Shearwater. As with the record of *Puffinus griseus*, the writer is very diffident of expressing an opinion as to the common species of Petrel on the western portion of Taranga. But whereas with the former some degree of certainty can be arrived at, the following notes may apply to *Puffinus gavia* or *Puffinus assimilis*:—"Head ashy brown; neck and upper parts ashy brown; wings slightly browner; underparts white; webbed feet tinged yellowish; length 12 inches." The writer found a dead Petrel hanging by the neck from a karaka tree, and removed the beak and claws for identification; as these, however, have been mislaid, no finality can be reached. The usual size for *Puffinus assimilis* is 11 inches, whereas *Puffinus gavia* is a bigger bird, about 14.5 inches. The bird identified by the writer was between the two.

Mr. R. Falla has sent the writer some very helpful remarks on the subject, namely:—"There are specimens (Reischek's) of both *P. assimilis* and *P. gavia* in Auckland Museum, marked 'Hen and Chickens.' Both are correctly labelled.

"(2) Reischek records in *Transactions of the New Zealand Institute*, that *Puffinus gavia* is common (unfortunately, he does not separate the Hen Island from the Chickens), and that he located only one small colony of *P. assimilis* on the northern side of an island.

"(3) I have found *P. gavia* in burrows on the Hen.

"(4) It is only three years since I dug a small (not young) *P. gavia* out of a burrow, and temporarily identified it by mistake as *P. assimilis*. I was misled by its small size, and the dark colour of a healthy specimen. I think *P. gavia* up here must be generally slightly smaller than your Cook Straits bird. *Puffinus assimilis* is a tropical species, and Hauraki Gulf is the southern limit of its range. In my experience of these waters, it is very rare, and I have never found its burrow. The only authentic records to date are Sandager (Mokohinou) and Reischek (Hen and Chickens)."

The above makes it very difficult for the writer to come to any decision. Undoubtedly birds with white underparts were more common than the dark-breasted Petrels, but they may not have all been the same species. A pair of birds had a burrow immediately outside our tent. The first night of our arrival, hearing one moving outside, the writer dazzled it with her torch, but touching it on the head by mistake, the bird took fright and dashed headlong down a steep stony gully leading to the shore, half-falling, half-flying, but, strange to say, did itself no harm. On December 7th another specimen was caught, possibly the same bird, the description of which is above. The writer identified it at the time as *P. assimilis* because of the small size. It had white underparts with only very faint grey marking on either side of the breast. It was remarkable how quiet the Petrel chick remained within its hole. Only once or twice did the writer hear a squeaking reply, like the chick answering the thin call of its parents.

Pterodroma macroptera. Great-winged Petrel.—As these birds sweep inland silently and almost as noiselessly enter their burrows, it is difficult to estimate their numbers, but probably they are the least common of the three species seen by us on the western portion of Taranga. On December 8th, Mr. Pycroft captured one of these birds outside the tent. It was 15 inches in length, with dark ashy brown upperparts, brown underparts, large black bill, and grey face. When handled, it was very gentle, and on being released, scuttled off to its burrow, becoming lost to sight in the bracken. On December 12th, at dusk, we proceeded to previously noted burrows, where we awaited the arrival of the occupants. About eight o'clock, one of the parent birds flopped clean through the undergrowth, and announced its presence by landing with a thud at our feet. When handled, it promptly vomited up the food for its young, which consisted of oil and fish of considerable size; then disappeared rapidly into its burrow. Half an hour later the other parent appeared, which we measured, and found to be 16 inches from beak to tip of tail. Neither bird uttered a sound the whole time. The second Petrel when released sat outside the burrow, apparently unable to understand what had happened, and did not move until gently propelled towards the burrow by Mr. Pycroft.

The exact time at which Shearwaters and Petrels return to their burrows appears to vary considerably. Some evenings, by 7.30 they were all wheeling and turning, preparatory to descending to their holes, making sweeping curves inland, then short flights out to sea, only to return again. At other times no Petrels were heard until 9 o'clock. As far as the writer could ascertain, *Puffinus gavia* or *assimilis* were nesting in the manuka about our camp, *Puffinus carneipes ?* higher toward the summit of the island, and *Pterodroma macroptera* on a headland, dividing our bay from the next. The nesting sites varied somewhat, but were distributed all over the western portion of Taranga from the sea upwards, one burrow being found under astelia, on the topmost peaks.

As far as we could judge, there were more Petrels nesting on the island when we arrived than when we left. The little Shearwater outside our tent, for instance, appeared to have ceased its visits ere we left Taranga, and we missed the distinguishing white underparts of *Puffinus gavia ?* from amongst the other Petrels, when watching them sweep inland from the ocean.

Again, although there were many burrows, riddling the hillside, a great many of them appeared to be old ones. A common site for a Petrel's nest was under the roots of a large pohutukawa tree, or beneath a giant boulder, which rendered it impossible for us to dig them out. One Petrel was nesting in a branch of a gnarled tree, about three feet from the ground. The aperture proving too narrow to insert the hand, a stick was pushed down by Mr. Pycroft, who distinctly felt an egg roll back. When withdrawn, the point of the stick was covered with nesting material and down.

Hypoleucus varius. Pied Shag.—A small colony of these birds resided on a large rock in the centre of the bay wherein our party was camped. On arrival, we counted from four to six, but as the weather grew worse, their number increased up to nine and twelve. Fully fledged young were amongst the group, and on December 18th, and on several occasions, the writer witnessed their incessant demands for nourishment from their parents. To emphasise their requirements, the young birds hit at the adults with their beaks, and flapped their wings, until their parents disgorged food. This they crammed so hastily down their offspring's throat that the latter moved backwards, and were driven off the rock. One young shag fell backwards into the water, where it could be seen struggling to swallow a large portion of fish which had been poked half-way down its throat. The appearance of a shoal of Dolphins in the bay seemed to mystify the Shags, for their invariably descended to circle about the water above them.

Microcarbo brevirostris. White-throated Shag.—On December 8th an individual bird was noted flying past our party, as we were walking along the shore towards the northernmost point. On December 10th, a young White-throated Shag appeared amongst the Pied Shags in our bay, catching fish at the base of a large rock. The following day it was again noted, accompanied by its parent; the young bird's plumage being black, whilst the adult Shag had a patch of white on the throat beneath the beak. On December 14th two White-throated Shags were seen with nine Pied Shags, sitting on a rock, it being too rough for them to fish.

Sula serrator. Australian Gannet.—During south-easterly winds and unsettled weather, Gannets came into our bay repeatedly. On December 11th a shoal of small fish approached the shore, amongst which a Gannet plunged several times, causing the fish to leap clean out of the water in their fright.

Sula leucogaster. Brown Gannet, or Booby.—On December 11th, at sunset, we saw what appeared to be a Gannet sail high above the island. When the sun shone on its upper parts, though too high to identify, it appeared light biscuit colour above, and white below. On December 7th the bird in question was seen by the writer, just passing out of sight round a headland. It was close enough to ascertain that it was the size of a Gannet, and biscuit brown in colour. Therefore, in view of the fact that Mr. W. M. Fraser has often seen *Sula leucogaster* in this vicinity, the writer took it to be the bird above mentioned.

Hydroprogne caspia. Caspian Tern. — We saw but few of these Terns during our stay on Taranga, though they were numerous in and about Whangarei Heads. It was not until December 12th that a pair entered our bay to fish, after which we saw them spasmodically.

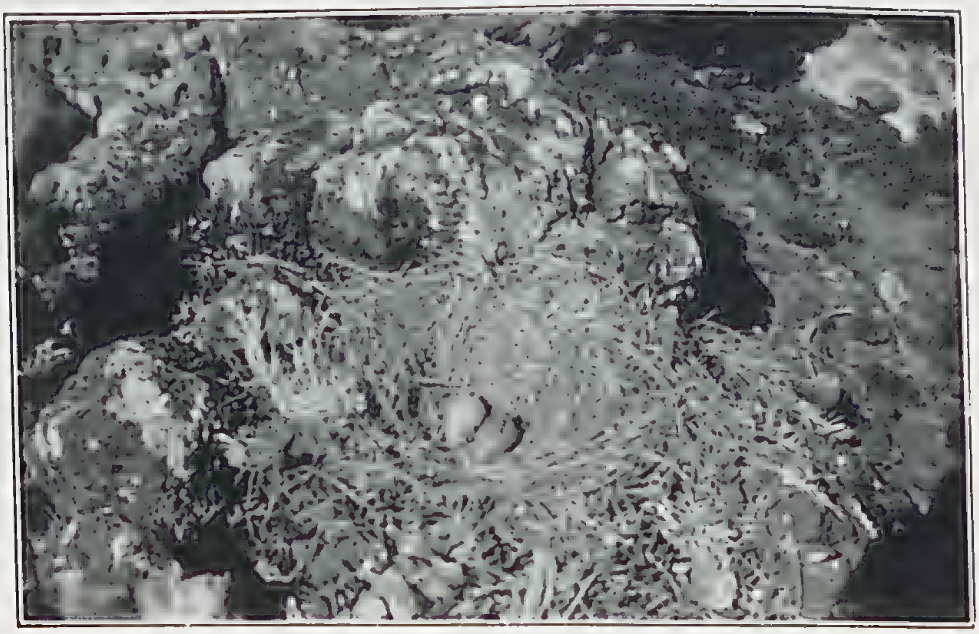
Sterna striata. White-fronted Tern. — These Terns were quite numerous, a pair nesting in each of the bays to the north and south of our camp. The first nest was situated on the top of a precipitous rock, on the foreshore, whither the parents repaired to feed their offspring with sardines. The second was well out to sea on a rock, but the female Tern could be seen clearly, sitting tight, in the peculiar attitude of these birds when brooding—tail cocked high behind. All passing birds were vigorously attacked by the male Tern. Once, it drove off an old Harrier, which was sailing low over the bush, forcing that bird of prey to beat a very hasty retreat. It was continually molesting two Black-backed Gulls, which had a nest on an adjacent rock. When driven away, to photograph her eggs, the female Gull tried to perch on a rock, but was repeatedly obliged to shift by the pugnacious little Tern, who, after every attack, returned to sit by his mate, and scream.

Larus dominicanus. Southern Black-backed Gull.—Only the above mentioned pair of Gulls frequented the western portion of Taranga. Their nest, when found on December 4th, was placed on the top of a large rock, and consisted of native grass, carefully arranged. It contained two eggs, one of which was much darker green than the other. These eggs had not hatched out when last visited on December 18th.

Demigretta sacra. Reef Heron.—On December 6th, a pair of Reef Herons were observed on the foreshore. Later, these birds were constantly seen fishing from rocks or flying low over the water.

Circus approximans. Gould's Harrier, or Swamp-Harrier.—From the day we landed, until we left, we occasionally saw a very old Harrier, almost white in colour, planing overhead. On one occasion it was pursued by a Kaka, Starlings, and Tuis, whose piercing shrieks caused much agitation amongst Parrakeets feeding in pohutukawa trees, disturbing two Pigeons, which hurriedly rose from neigh-

Western portion of Taranga, with curious figure-head in the cliff face.



Nest of Black-backed Gull *(Larus dominicanus)*.

Photos communicated by Mrs. P. Moncrieff, R.A.O.U.

bouring trees and flew away. On December 17th, when on the summit of the island, Mr. Pycroft and the writer heard the note of a Harrier, "klee, klee," also an intimate call-note, which led us to surmise we were not far from its nest. On December 8th, three Harriers appeared early in the morning, seeming to be coming inland from the sea. Two circled over the island, whilst the third beat out to sea, as if making for the mainland. Unfortunately for the observer, it encountered a scow, which caused it to retreat back to Taranga. The sudden appearance of these birds seems to indicate that this species flies to and fro from the mainland.

Ninox novæ-seelandiæ. Morepork.—These little Owls appear to be quite plentiful on Taranga, and were seen by our party several times. Once, we found the roosting place of a Morepork under the roots of a big tree. Some primary and a few breast feathers lay on the ground, also one pellet composed of beetles' wings. Further on, we startled the Owl from a hole in a large puriri tree, upon which it was immediately attacked by Tuis and Bellbirds, which came on the scene, attracted by each others' piercing shrieks. The Morepork had a hard task to get away from them, and when further disturbed in the afternoon of the same day, was pursued by an old Kaka, who worked himself into a great state of excitement, and gave the Owl no rest until the latter dodged back to its hole, chased by an excited Tui, which managed to pull up miraculously, just as the Morepork disappeared down the tree trunk. Several times we endeavoured to creep up to a Morepork in order to photograph it sitting on a branch. But it invariably permitted us to come within a certain distance, then flew noiselessly away, denoting that these birds see quite well in the somewhat dark light of the big trees. The writer found an imitation of a Morepork's cry would attract Kakas, Bellbirds, and Tuis.

Cyanorhamphus novæ-zelandiæ. Red-fronted Parrakeet.—The majority of Parrakeets, which are in fair numbers on Taranga, belong to the red-fronted species. They seem to frequent the lower portion of the island, amongst the smaller bush, though occasionally they are to be seen amongst the big timber trees of the forest. During our visit, they mainly flew backwards and forwards from one pohutukawa tree, in blossom, to another, alighting on toi-toi grass, and regularly feeding every morning and evening on flax plants, outside our camp. The method of obtaining food was to nibble the flax pod and extract the seeds, the parrakeet working systematically up the flax stem. When one plant was exhausted, the parrakeets transferred their attention to another. We saw pairs, but never more than three birds in a group, though strongly suspecting a pair of parrakeets of having a nest in the vicinity. There appeared to be no difference between these birds and members of the same species on the mainland. Mr. W. M. Fraser stated that, on the 8th January, 1928, he landed on one of the Chicken Islands, where he found several parrakeets, including a young one just able to keep out of his way.

Cyanorhamphus auriceps. Yellow-fronted Parrakeet.—We were anxious to make sure that this little Parrakeet was on Taranga, and were fortunate enough to see some close enough to make identification certain. Individual birds of this species were once or twice seen by Mr. Pycroft, and the writer, and on December 9th two were seen by Miss McArthur, feeding on flax in company with a Red-fronted Parrakeet.

Nestor meridionalis. Kaka.—When on the north side of the island, the writer saw a Kaka fly out from a rocky headland, as if from the proximity of its nest. From four to six came over our camp (in the west) regularly every morning and evening, having, judging from the sounds, young birds amongst them. On December 8th, we came across this party of Kakas amongst the large timber trees inland. They came down in answer to whistles and imitation Morepork notes, revealing two fully fledged young birds amongst them. Just when about to take their portraits, they were driven away by an old Kaka, with an exceptionally long bill. We suspected this bird of having a nest in the vicinity, as he and his mate were found, usually in the same spot, exhibiting signs of nervousness, at our appearance. In traversing the bush, we observed indications of Kakas having extracted grubs from young kawa kawa trees. Doubtless, there may have been more Kakas in the portions of Taranga we did not visit. But in view of the fact that these birds roam considerably, and only a limited number were seen, the writer formed the opinion that there were not many more Kakas on Taranga at that season of the year, though, doubtless, they fly over from the mainland.

Halcyon sanctus. Sacred Kingfisher.—Only one individual of this species frequented our bay, though occasionally the call-note of this bird was heard in the distance. We usually saw it flying from the beaches to the overhanging trees.

Lamprococcyx lucidus. Shining Cuckoo.—Heard intermittently.

Rhipidura flabellifera. Pied or Grey Fantail.—These birds were not numerous in the western portion of Taranga. A pair were nesting in manuka above the seashore, and frequently sallied forth to hawk insects above the rock. We then observed that one Fantail had more white feathers in the tail than usual. This is interesting in view of the fact that Mr. W. W. Smith, in communication with the writer on the subject of "albinoism," stated that he had practically never seen any variation in the plumage of Fantails.

Miro toitoi. North Island Tit.—This species was not often seen in the western portion of Taranga. On December 5th, and again on December 6th, one was heard. The following day a female Tit was located by Mr. Pycroft, when negotiating a steep gully running inwards from the shore. Not until December 13th was another seen; a female was then observed. Finally, a male bird was seen by Mr. Pycroft on December 16th. A Tit was amongst the few birds noticed by our party when in the vicinity of the summit of the island.

Turdus philomelus. Song Thrush.—One song thrush had found its way to Taranga, whence its clear notes were frequently heard during the day, also very early in the morning, vying with the Tuis. We only once obtained a glimpse of the singer. Mr. W. M. Fraser informed us that he had also heard a Blackbird on the island.

Gerygone igata. Grey Warbler. — Not numerous, but found on Taranga. On December 5th one was seen and another observed on the summit of the island. Fully fledged young were being fed by their parents on December 9th, amongst the manuka overhanging the seashore.

Zosterops halmaturina. Grey-breasted Silvereye. — Occasionally heard and seen in small numbers.

Anthornis melanura. Bellbird. — This species is common on Taranga, though not as numerous as the Tui, *Prosthemadera novæseelandiæ.* In common with them, they seem to prefer the patches of country covered with manuka, although Bellbirds are to be met with in the large bush areas. One was noticed up a gully on the northern side of the island, in company with a Red-fronted Parrakeet. Another individual, close to the camp, had an unusually monotonous tune of five notes, with a rising tendency, C, G, E, G, C, but slightly flat, thus the chord of C does not quite express it unless whistled with a tendency towards the minor. It is this difficulty which often makes people say that they have tried a bar of music supposed to represent the notes of some bird, and found it not at all like. Apparently, this particular song was unique on Taranga, as the writer never heard another Bellbird indulge in this tune. On December 4th, attracted by low twittering, we located a young Bellbird, which, though able to fly, was still being fed by its parents. On several occasions, we found fragments of egg-shell belonging to Bellbirds, white, faintly spotted rusty red, lying beneath trees in the bush, but apparently the nesting season was practically over, as we did not come across a Bellbird nesting, and all young seen were fully fledged.

Prosthemadera novæ-seelandiæ. Tui.—These birds are undoubtedly the most common species on Taranga. They were to be seen throughout the western portion of the island during our visit, though, like the Bellbird, they showed a preference for manuka-clad country. We found nests all the way to the summit of the island, and the Tui was seen on the topmost peaks. The majority of the birds had young, just out of their nests, which they were occupied feeding, but we were able to locate several late nests. Unlike Tui nests on the mainland, these were extremely easy to find, and, almost invariably, were made of manuka, though the interior varied according to the taste of individual builders; some being clumsily lined with feathers, whilst others, woven with native grass, were models of neatness. The Tuis were not very tame, and varied considerably in the manner with which they permitted their nests to be examined. Some emitted piercing shrieks, which attracted Tuis to the neighbourhood; others bore their fate with calm, almost with indifference.

The following is a record of their nests:—

(1) On December 4th we followed a Tui, which we observed entering and leaving manuka, on the low cliff above the shore, and were led to the nest by the sound of young birds chirping. They emitted a plaintive note, not unlike that of a young Blackbird. The nest was 7ft. up in a manuka tree, being made of manuka twigs, which had become plastered outside by the young birds' excreta. The Tuis themselves had parasites, ticks, and red insects (query, some form of lice?) There were three nestlings, two cocks and a hen. One of the former and the hen were practically fledged. The second cock, which lay beneath the other two, still had quills protruding. All three were extremely healthy and well nourished. On being placed in the sun, to be photographed, nest and all, their placid attitude vanished, and they exhibited signs of great distress, gaping with their beaks and panting. Afterwards we re-placed the nest in its original position, and during the whole process, the parents evinced practically no signs of distress at the nest being removed. This was unlike two Tuis, with young birds, seen the same afternoon, which chased all passing birds away. On December 9th we re-visited the nest. One bird was sitting beside it on a twig; another flew out to perch nearby when we attempted to remove it, and we were left with the small cock, not so advanced as the others, which, when replaced in the nest, after being photographed, was quite content to lie therein.

(2) On December 5th a second nest was found in a karaka tree, on a hillside, amongst large pohutukawas. It was made of manuka twigs, with stems of dried convolvulus (*Ipomea*).

(3) The third nest was found in between stems of karaka and the main trunk. It was built up of manuka twigs, until the nest was a foot deep in material, six feet from the ground. The interior of the nest was 2½in. deep x 2⅜in. wide; it was lined with Petrel feathers, which caused the nest to smell musty. Apart from cobwebs holding the twigs together, no other lining had been made. The eggs, three in number, were lightly blotched and speckled on the top with rusty red, with the exception of one which was almost white.

(4) This nest was 7ft. up in a small fork of a kohekohe tree, leaning against a dead branch. It had very little foundation of manuka, and was beautifully lined within, with native grass. It contained three eggs lighter in colour than those of the nest previously described.

(5) A fifth nest, with a Tui, sitting very close (so close that it permitted the branches to be broken off, to afford a better view with the camera), was in a Mahoe tree, 13-14ft. from the ground, neatly lined with native grass, and contained four eggs.

Anthus novæ-seelandiæ. New Zealand Pipit.—On December 6th a young Pipit was seen flying from rock to rock on the foreshore, also on December 8th, after which it was seen from time to time.

Sturnus vulgaris. Starling.—A small colony of these birds have established themselves on the cliff face on the north-western portion of Taranga. Their numbers do not at present exceed twenty or thirty, if that.

Nesting of the Spur-winged Plover in Captivity.—The following notes were supplied to me by Dr. S. C. Jamieson, of Yarrawonga (Vic.), and it is interesting to know that the incubation takes approximately four weeks:—

About twelve years ago or more we began to keep Spur-winged and Black-breasted Plovers in our garden of about half acre of lawn, and flowers and vegetable garden. On September 15th, 1927, we noticed that an egg was laid on a bare garden bed. On 17th September a second egg was laid, and on 19th September a third egg appeared. The 20th September the parents were sitting in real earnest, and one day, whilst engaged in driving off a Goshawk, and so staying near the so-called nest for a considerable time, it was noticed that both the male and female birds shared the "sitting." The bird on the nest, when tired, would utter a little call, and the mate would immediately *run*, not walk, to the nest, and when about to sit would at first carefully arrange the eggs with the beak, and very carefully lower itself into the sitting position. This change of guard was very interesting to watch. The first chick was noticed early in the morning of 17th October, and at 5 p.m. the same day the second chick was hatched. The first chick was taken for its first walk on the morning of the 17th October by the bird off the nest, and in the morning of the 18th October the third chick was hatched, and that same day the proud parents and their family moved about a little, and the young birds were quite active at once. The Kookaburras then took a hand. The old birds used to stand up and offer defiance to them. The house cat saw to those of his kind who trespassed, and protected the birds from them. The growth of the chicks was very uneven, one being twice as big as the next, and that one again twice as big as the last hatched. In about three months they had all evened up as regards size.—E. A. D'OMBRAIN, Sydney (13.6.28).

The Avifauna of the Upper Reaches of the Macleay River, N.S.W.

By J. J. DE WARREN, R.A.O.U., George's Creek, Macleay River, N.S.W.

Communicated by NEVILLE CAYLEY, M.B.O.U., State Sec., N.S.W.

With its source in the rich pasture lands of New England, tumbling over many falls, rushing through mighty canyons, rolling along a boulder-strewn course, the Macleay River has carved a way through slate and granite to empty into the sea at South-west Rocks, near Kempsey. In the upper reaches of this fine stream, rarely visited by man, are a great many dark brushes, deep gorges and heavily grassed mountain sides, with deep gullies and rocky crags. With its isolation and ruggedness, the whole makes a natural sanctuary for some of our rarer birds. It is an ideal National Park.

Since February 1st, 1928, I have made the following notes:—

Alectura lathami. Brush Turkey.—High up in the larger brushes I have observed these birds, and have found many of their remarkable nesting mounds. Before the advent of the fox the birds and their mounds could be found within fifteen minutes' walk of East Kunderang Station.

Coturnix pectoralis. Stubble Quail. — First seen at Mr. A. J. Rafferty's "Lumeah" property, on this river, on July 7th, when I flushed four.

Synoicus australis. Brown Quail.—Small coveys were often flushed on the lower hillsides. Quail are not plentiful here, in the Moss Vale district, nor in the north-west to the east of Moree, where I had opportunities for observation last year. Bonshaw, on the Queensland border, was the only locality where any numbers were noted. In some well-grassed paddocks, the Brown Quail were much in evidence.

Turnix maculosa. Red-backed Quail.—Three ran along in front of me on a spur above the junction of George's Creek with the river, giving me good time for close observation. These birds were flushed several times afterwards. Two were also flushed on the Petroi Tableland, twenty miles up George's Creek.

Turnix varia. Painted Quail.—Quite a number were heard calling during February at George's Creek. I noted also the trumpeting of the male—not unlike the "oom-oom-oom" of the Tawny Frogmouth *(Podargus strigoides)*, but sharper and softer. Mr. Stanley-Gibbons, R.A.O.U., of Sutton Forest, who breeds Quail, could give some interesting notes on this species.

Megaloprepia magnifica. Wompoo Pigeon.—I saw one bird in a brush near George's Creek Post Office, and heard its never-to-be-forgotten call on Sunday Creek.

Most of the places I mention in these notes are of easy access to the main Armidale-Kempsey Road, and accommodation can be obtained at George's Creek, Mr. C. H. O'Neil being the proprietor.

Lopholaimus antarcticus. Topknot Pigeon.—A small flock was seen at "Top Creek."

Macropygia phasianella. Brown Pigeon.—This was the most common Pigeon in the district. When the fruits of the "inkweed or dye-berries" are ripe, these birds get very tame after gorging on the fruit, and can be approached within a few feet before they take flight.

Geopelia placida. Peaceful Dove.—A few were observed near all permanent water, and in places quite large flocks were seen.

Geopelia cuneata. Diamond Dove. — One pair was observed at "Gerygone," and another pair was seen twelve miles up George's Creek.

Chalcophaps chrysochlora. Green-winged Pigeon.—A few were in every brush visited, being particularly prominent on Top and George's Creeks.

Phaps elegans. Brush Bronzewing.—One bird was flushed on the Sunday Creek spur. I had only a fleeting glimpse of it. At the moment it appeared to be the above species; afterwards I thought it may have been Common Bronzewing (*P. chalcoptera*).

Leucosarcia melanoleuca. Wonga Pigeon.—These beautiful pigeons have often come right up to my feet when I have been motionless and calling the birds of the brushes. They are quite common, but A. J. Rafferty, Esq., R.A.O.U., and other local residents have informed me that their numbers have greatly decreased in the past few years, the fox and drought being the main cause of the reduction in numbers.

Rallus pectoralis. Lewin Water-Rail.—A small water-fowl observed in the reeds across the river was considered to be of this species.

Podiceps ruficollis. Little Grebe.—A pair was swimming in a billabong at the junction of George's Creek in February, but continuous floods have driven them away.

Gallinula tenebrosa. Dusky Moor-hen.—There were several in the reeds of a small billabong at George's Creek junction; they shared the same fate as *P. ruficollis*.

Phalacrocorax carbo. Black Cormorant.—These Cormorants averaged about one to the mile of river traversed; none was observed in any of the creeks.

Phalacrocorax fuscescens. White-breasted Cormorant.—About two were seen to every mile of river traversed, and occasionally they were seen on the larger creeks.

Phalacrocorax varius. Pied Cormorant.—Several were seen on the river. One was so busy with its fishing that it rose to the surface close to where I was sitting. It did not know whether to fly or dive; it tried to do both, and did neither, but fluttered about the water with its head under for a few seconds before it managed first to dive a few feet, then, after hitting the water a few times with its wings, to rise into the air.

Microcarbo melanoleucus. Little Pied Cormorant.—Wherever there is permanent water with sufficient depth, this little chap can be seen.

The Australian Pelican and the Black Swan are visitors. The latter nested yearly on "Gerygone," but continuous floods have prevented them this year. Neither bird has been observed so far.

Anhinga novæ-hollandiæ. Australian Darter.—One bird was observed on July 7th.

Lobibyx novæ-hollandiæ. Spur-winged Plover.—There are numbers to be seen after every flood, feeding on the gravel beds, but it could not be said that they were numerous.

Charadrius melanops. Black-fronted Dotterel. — Many of these small birds are to be seen along the water edges.

Peltohyas australis. Australian Dotterel.—One pair only was observed on the gravel at "Gerygone."

Gallinago hardwicki. Australian Snipe.—Heard calling at George's Creek junction many times during February, but not later.

Burhinus magnirostris. Southern Stone-Curlew. — A pair noted, with nearly fledged young, in February and March at George's Creek junction; others were heard giving their plaintive call at "Lumeah," "Kunderang East," and "Gerygone," on the river, also near the "Boulders," George's Creek. Ibises and Spoonbills have been conspicuous by their absence so far.

Notophoyx novæ-hollandiæ. White-faced Heron. — The so-called "Blue Crane" is very much in evidence both on the river and on George's Creek.

Nycticorax caledonicus. Nankeen Night Heron.—Early in the year there were several present, but none is seen now (July).

Chenonetta jubata. Maned Goose or Wood Duck.—Several small flocks were seen on the river. A few years ago it was quite common to see fifty or so in a flock; now ten or twelve is all one may see together.

Anas superciliosa. Black Duck.—Formerly only a pair or two were seen at frequent intervals along the river, seldom in flocks. Since 10th July, however, numbers have been seen on the river, apparently driven down from New England by the floods.

Querquedula gibberifrons. Grey Teal.—Three only were observed near Booth's farm, George's Creek.

Circus assimilis. Spotted Harrier.—One pair was seen at "Riverview" (Half-way House), another pair near East Kunderang, and one solitary bird at "Gerygone."

Astur novæ-hollandiæ. Grey Goshawk.—Noted near the 55-mile peg, Kempsey Road, and at A. J. Rafferty's, where they were nesting, July 1st.

Accipiter cirrocephalus. Collared Sparrow-Hawk.—A pair nested in a tall eucalypt at George's Creek Junction.

Uroaetus audax. Wedge-tailed Eagle.—This locality is the home of the Wedge-tail; here he abounds in a correct setting. Rabbiters destroy quite a number of these noble birds by careless poisoning for foxes. One killed three on "Gerygone" with one bait; the largest measured nine feet four inches, and, judging by the claws and bill, must have been nearly one hundred years old.

Hieraaetus morphnoides. Australian Little Eagle.—A few were in evidence. One pair had a nest in a tall eucalypt on "Gilkenson's Farm," George's Creek.

Haliæetus leucogaster. White-breasted Sea-Eagle.—During February and March, numbers of these Eagles came in from the coast, thirteen being observed within six miles along the river. Many times I have noted six birds in the air at once, with several Wedge-tails overhead, flying in wide circles over the river.

Haliastur sphenurus. Whistling Eagle.—This is the only district visited where the "Whistler" plays second fiddle to the Wedge-tail in numbers.

Elanus axillaris. Australian Black-shouldered Kite.—A pair has a nest across the river from my camp at "Gerygone," where I often see them chasing the Wedge-tails.

Falco longipennis. Little Falcon.—I have seen all the Falcons of the Australian list in this district, with the Brown Hawk *(F. berigora)* and the Nankeen Kestrel *(F. cenchroides)* most in evidence.

Falco hypoleucus. Grey Falcon.—A pair was observed near the 53-mile peg, and another was very much in evidence at George's Creek Post Office, where it takes a heavy toll on the chickens.

Falco peregrinus. Peregrine Falcon.—One bird only was noted during a ramble at the head of Middle Creek. Later, on July 19th, I saw another of these birds at the mouth of Sunday Creek.

Falco subniger. Black Falcon.—On several occasions when I was calling up the birds on the edge of a brush, one of these smart little Falcons would swoop down amongst the small birds, and was gone almost as swiftly as it came. I cannot say if it were successful or not.

Falco berigora. Brown Hawk.—Nesting at Mr. Rafferty's. In the next tree is a nest of the Whistling Eagle *(Haliastur sphenurus)*.

Falco cenchroides. Nankeen Kestrel.—A pair was observed near every homestead.

Ninox boobook. Boobook Owl. — Often heard calling. For some time a pair has been camping in a thickly foliaged tree near my camp at "Gerygone," where they keep up their monotonous "mo-poke" most of the early part of the night. Night birds are not plentiful in this district, whilst rats and mice are prevalent all over the district.

Ninox strenua. Powerful Owl.—Only one was observed. I was calling the birds in a brush near George's Creek, and had quite a collection around, when, from a "callouse" on a stinging tree, a large Owl flew in amongst them, and away into the darker brush beyond, presumably with a feathered creature in its claws.

Tyto novæ-hollandiæ. Masked Owl.—From February 1st until the middle of March, a young bird was fed by the parents near my camp. Over half a mile away another young Masked Owl was going through the same procedure. They appeared fully fledged at the commencement of my observations, though the pleading note became stronger as the time went on.

Tyto tenebricosa. Sooty Owl.—One of these birds was observed on July 21st, in an open brush at "Lumeah." He was searching in some fallen debris, and flew into a tree a few yards away, when I was able to get an excellent view of him.

Trichoglossus moluccanus. Rainbow Lorikeet.—The eucalypts have not flowered in abundance this season, so very few honey-eating Parrots have been in evidence.

Glossopsitta pusilla. Little Lorikeet.—None was seen since February, when a few were observed in the flowering apple-trees.

Glossopsitta concinna. Musk Lorikeet.—A few small flocks were noted early in the year.

Opopsitta coxeni. Red-faced Lorilet.—A few were feeding on the figs in a brush near George's Creek Post Office.

Calyptorhynchus banksi. Red-tailed Black Cockatoo.—Quite a number was to be seen eating the kernels of Casuarina cones.

Calyptorhynchus lathami. Glossy Black Cockatoo.—Many small flocks were observed high up in the mountains at "Gerygone." For half an hour I had an uninterrupted close-up view of seven of these birds while they were busy with the cones of the Forest Oaks. With Mr. Rafferty, I picked up a dead female of this species, but the cause of death I could not ascertain.

Calyptorhynchus funereus. Yellow-tailed Black Cockatoo.—Numbers were seen almost daily, and trees stripped of their bark showed where the birds had extracted white grubs.

Kakatoe galerita. White Cockatoo.—Quite numerous on the river, where I have counted between thirty and forty in at least five flocks. On one occasion, when they were flying over "Lumeah," eighty-three were noted. They feed on the seeds of the Nagoora burr in season, and, with the King Parrot *(Aprosmictus scapularis)* and the Crimson Rosella *(Platycercus elegans)*, must keep this pest well in check, as the quantity of seed that they destroy is enormous.

Aprosmictus scapularis. King Parrot.—Many of these beautiful parrots were observed, particularly at Booth's farm and "Lumeah."

The Red-winged Parrot *(A. erythropterus)* is also here, but so far I have not met with that species.

Platycercus elegans. Crimson Rosella.—This is the most common of all the Parrots in this district, where they help considerably in keeping thistles and Nagoora burr in check.

Platycercus eximius. Eastern Rosella. — Not so plentiful as the Crimson Rosella.

Parrots are not common in this locality, excepting at times the honey-eating Lorikeets, when they appear in thousands. None of the rarer Parrots have been brought to my notice by local residents, nor can they call to mind any by the descriptions that I have drawn up.

Podargus strigoides. Tawny Frogmouth. — Like the other night birds, this bird is seldom seen or heard.

Ægotheles cristata. Owlet-Nightjar.—Occasionally heard, and less frequently seen.

Eurystomus orientalis. Dollar-Bird. — A few pairs nested at George's Creek, and departed from the district about March 7th.

Alcyone azurea. Azure Kingfisher.—There were quite a number of these quaint little creatures. The last one I noted was on Top Creek on the 9th July. Some must remain here all the year.

Dacelo gigas. Laughing Kookaburra. — This old sinner is very much in evidence.

Halcyon macleayi. Forest Kingfisher.—The solitary flight of this bird was well known to me as a resident on the Queensland coast, and I am not mistaken in my observations. Several were noted. They departed about the 15th of March.

Halycon pyrrhopygius. Red-backed Kingfisher.—There were a few on the river and on George's Creek. They left about the middle of March.

Halycon sanctus. Sacred Kingfisher.—Could be seen any day until April 1st.

Merops ornatus. Rainbow Bird.—These birds appeared to depart on March 10th, but on March 25th hundreds made their appearance. and remained for a few days! Cannot say when they finally left the district, as it rained for a few days about that time.

Eurostopodus guttatus. Spotted Nightjar.—A few were seen or heard; they are not at all plentiful.

Hirundapus caudacutus. Spine-tailed Swift.—A few were observed before a storm on March 1st.

Micropus pacificus. Fork-tailed Swift.—Noted on March 1st flying lower than the Spine-tail.

Cuculus pallidus. Pallid Cuckoo.—Heard the well-known call, but did not see the bird. With so many feathered mimics in the district, it is hardly wise to list a bird without seeing it.

Cacomantis flabelliformis. Fantail Cuckoo.—I saw a few of these Cuckoos early in March, but not later. They must have departed soon afterwards, otherwise I must have seen them again.

Cacomantis pyrrhophanus. Square-tailed Cuckoo.—The most noticeable Cuckoo here. Over-night on April 20th, their numbers were enormously increased, frosts in New England having driven them below the range, I presume. In mid-July, they are still here.

Lamprococcyx lucidus. Shining Bronze-Cuckoo.—A few were observed, both on the river and in the hills.

Lamprococcyx plagosus. Golden Bronze-Cuckoo.—Like the Square-tailed Cuckoos, their numbers were increased on April 20th.

Eudynamys orientalis. Koel.—Last heard on February 15th.

Scythrops novæ-hollandiæ. Channel-billed Cuckoo.—Not heard or seen after February 15th.

Centropus phasianinus. Pheasant Coucal.—Heard at "Lumeah," and one observed at "Gerygone."

Menura novæ-hollandiæ. Lyrebird.—There are numbers of these grand mimics here. In a little brush near George's Creek Post Office, one bird imitates the siren of the service car. There I heard him imitate the call of the Rufous Scrub-Bird *(Atrichornis rufescens).* In the same brush, I found four nests on the face of a cliff.

Atrichornis rufescens. Rufous Scrub-Bird.—After diligently exploring most of the likely places within a radius of twelve miles of George's Creek, including a trip into Sunday Creek—so named by the old settlers because it was too rough to explore on a working week-day, it was left with a promise of a visit some Sunday. I was invited to join a party in a hunt after wild cattle on Petroi Tableland, the attraction to me being the fact that one of the men had seen a bird answering to the description of *Atrichornis.* The first trip was a failure, from my point of view, though a great joy to the remainder of the party. After much manœuvring, we landed a big bull, and three cows, with calves. Next trip we brought back three more, after many exciting moments with the charging animals. While two of us were watching a bull that had been bailed up in the dense tree-ferns and undergrowth, I heard a Rufous Scrub-Bird, but could not move, until the coachers were brought up, as the stockmen did not want to lose the bull. That was the only occasion on which I came in close proximity with the bird; still I hope to get well acquainted in the spring.

Hirundo neoxena. Welcome Swallow.—Quite a number have remained for the winter, mainly in the bush, where they camp in caves at night. The main body left on May 7th.

Cheramœca leucosterna. White-backed Swallow.—There are numbers of these pretty little chaps in this district. They are most noticeable in the vicinity of homesteads. Old hands say that they are most uncommon, and had not been noted for many years.

Hylochelidon nigricans. Australian Tree-Martin. — Plentiful in the ring-barked country. They departed on April 5th.

Hylochelidon ariel. Fairy Martin. — Only two were observed at George's Creek.

Rhipidura flabellifera. Grey Fantail.—Most noticeable all over the district.

Rhipidura rufifrons. Rufous Fantail.—Seen on the edges of most brushes.

Rhipidura leucophrys. Willie Wagtail.—Our little friend is not as common here as he is in the west.

Myiagra rubecula. Leaden Flycatcher.—I have seen many about the bigger brushes and darker places by the river.

Seisura inquieta. Restless Flycatcher. — More common than the Willie Wagtail, which is unusual.

Monarcha trivirgata. Spectacled Flycatcher.—One pair was observed several times in a brush near George's Creek Post Office.

Monarcha melanopsis. Black-faced Flycatcher.—Quite plentiful, and observed in all the likely places.

Micrœca fascinans. Jacky Winter.—This little favourite is not at all common, although it is to be noticed near all homesteads.

Petroica multicolor. Scarlet Robin. — First observed on a spur above George's Creek Junction, at the end of February.

Petroica phœnicea. Flame Robin.—Had not been seen since early in March, until recently (about July 1st), when they appeared in numbers.

Petroica rosea. Rose Robin.—Most common of all the Robins here. Some of these birds have particularly dark breasts—a deep magenta in colour.

Melanodryas cucullata. Hooded Robin. — Observed one pair only near the 57-mile peg, Kempsey Road, on March 19th.

Eopsaltria australis. Southern Yellow Robin.—Noted many in the various brushes and along the river.

Eopsaltria chrysorrhoa. Northern Yellow Robin.—Very often observed, although not as numerous as the preceding.

Eopsaltria capito. Pale-Yellow Robin.—Observed a pair in a little brush on a spur between George's and Sunday Creeks, also in the Petroi scrub. The female was almost devoid of yellow.

Pachycephala pectoralis. Golden Whistler. — Most notable in some of the brushes, where their numbers have attracted me. Still those are exceptional cases, as this bird is not nearly so common as it is further south.

Pachycephala rufiventris. Rufous Whistler. — I met with a fair number early in the year, when their glorious notes could be heard everywhere. I have not seen any since May.

Pachycephala olivacea. Olive Whistler.—Perhaps the most common of the Whistlers, as a day rarely passes without this little chap appearing in response to my notes.

Colluricincla harmonica. Grey Shrike-Thrush. — Observed everywhere; whether in mountain, creek or brush, it is one of the first to answer my call. I have noted it eating bees and ink-weed berries (dye-berries).

Colluricincla megarhyncha. Rufous Shrike-Thrush.—First seen in a little brush near George's Creek; often met with afterwards.

Grallina cyanoleuca. Magpie-Lark or Peewee.—The farmer's friend must have a lot to do elsewhere, as I rarely see him here.

Psophodes olivaceus. Eastern Whip-Bird. — There are numbers of Whip-Birds in this district, and I have called them up close enough to touch them at times.

Coracina novæ-hollandiæ. Black-faced Cuckoo-Shrike.—A few may be seen any day. With the Grey Shrike-Thrush and other birds I saw them making a meal from a swarm of bees. They also relish the flavour of dye-berries.

Coracina robusta. Little Cuckoo-Shrike.—One pair only was noted at George's Creek.

Lalage tricolor. White-winged Triller.—A few were in the district, and were last seen about February 20th.

Orthonyx temmincki. Southern Log-runner. — These noisy little chaps have often spoilt interesting observations with their chatter. They are great scratchers, their action being much like that of the Brush-Turkey *(Alectura lathami).* Observed in many of the little brushes near George's Creek, where I looked on them as particular friends.

Cinclosoma punctatum. Spotted Quail-Thrush. — Many were observed on the mountains about the river, where I noted the Quail-like plumage of the young, taking them for a variation of the species or something new. Mr. J. R. Kinghorn, of the Australian Museum, Sydney, showed me my mistake.

Gerygone olivacea. White-throated Warbler.—Numbers were observed, and their sweet little song was very much appreciated.

Gerygone richmondi. Brown Warbler.—Often seen, although the preceding species would out-number them.

Gerygone flavida. Fairy Warbler.—On the spur opposite George's Creek Post Office, at five minutes' walk, I saw three Gerygones, with yellow throats; later I noted two more further up the slope; these I called up many times afterwards, and concluded that they were either "Sports" or Fairy Warblers, though that species is not recorded south of Rockhampton.

Smicrornis brevirostris. Brown Weebill.—Often met with.

Aphelocephala leucopsis. Eastern Whiteface.—Was surprised to see seven of these little chaps early in February, at the junction of George's Creek; not observed afterward.

Acanthiza nana. Little Thornbill.—Well in evidence.

Acanthiza pusilla. Brown Thornbill.—My observations of this bird have been made more about the river than the hillsides.

Acanthiza reguloides. Buff-tailed Thornbill. — Numbers of this species were met with.

Acanthiza chrysorrhoa. Yellow-tailed Thornbill.—Nearly every day one can see flocks of these small birds. They were nesting on July 1st.

The season being mild here, numbers of the smaller birds are building, and in some instances are brooding. I have noticed several of the birds of prey renovating their old nests. Scrub-Turkeys are raking up their mounds, while the Lyrebird seems to have given up his mimicry for a time—a lull before a storm, no doubt.

Sericornis frontalis. White-browed Scrub-Wren.—Can be found in all the brushes, and any dark place along the river.

Sericornis lævigaster. Buff-breasted Scrub-Wren.—Observed in many of the larger brushes, notably at "Top Creek" and at "Gerygone."

Sericornis lathami. Yellow-throated Scrub-Wren.—First seen at top of brush, near George's Creek, afterwards at Petroi, Top Creek, and Gerygone.

Sericornis magnirostris. Large-billed Scrub-Wren.—On my initial jaunt into the bird-world at George's Creek, this bird was the first to answer my call. A few were seen afterwards in the larger brushes.

Calamanthus fuliginosus Striated Field-Wren. — Observed at the top of "Big Hill."

Chthonicola sagittata. Speckled Warbler or Speckled Jack.—Nowhere have I observed these birds in greater numbers.

Cinclorhamphus mathewsi. Rufous Song-Lark.—Often seen in the early part of the year, but I have not observed them since the winter set in.

Megalurus gramineus. Little Grass-Bird. — Several were noted near the 37-mile peg, on the Armidale-Kempsey Road.

Acrocephalus australis. Australian Reed-Warbler.—A few only were observed; they departed about May 7th.

Malurus cyaneus. Superb Blue Wren.—Quite plentiful; at present you can see the young males in every stage of change of plumage. Numbers were nesting on July 1st.

Malurus lamberti. Variegated Wren.—Have observed a few pairs in secluded places in many parts of the district.

Malurus assimilis. Purple-backed Wren.—I chanced upon one male with his long blue-tailed attendants, in Top Creek, but am a little doubtful.

Artamus melanops. Black-faced Wood-Swallows. — The most numerous of Wood-Swallows here. They left early in May.

Artamus cyanopterus. Dusky Wood-Swallows.—Only a few in the district, from whence they departed on April 17th.

Neositta chrysoptera. Orange-winged Sittella.—Small flocks were often seen.

Neositta leucocephala. White-headed Sitella.—A few were observed on the "Big Hill," Kempsey Road.

Climacteris picumnus. Brown Tree-Creeper.—One of these little chaps was a regular visitor to my camp at George's Creek, where he often fooled me with his mimicry. Included in his repertoire, were the following calls—the Crimson Rosella, the Rufous Whistler, Whistling Eagle, Red-backed Kingfisher, Rainbow-Bird, and Pallid Cuckoo. This is the first time that I have heard the Brown Tree-Creeper imitating; but, after hearing the White-browed Wood-Swallow *(Artamus superciliosus)* (with Miss Betty Morrisby, R.A.O.U.), at "Jaffra," Texas, last year, when he gave some excellent imitations of the calls of the commoner bird, I am an optimist.

Climacteris leucophæa. White-throated Tree-Creeper.—This bird is to be seen in all the brushes, and almost anywhere else.

Climacteris erythrops. Red-browed Tree-Creeper.—Observed only on the Petroi Tableland, although they could be elsewhere.

Climacteris affinis. White-browed Tree-Creeper. — Not common. Fully fledged young seen at "Lumeah" on July 7th.

Dicæum hirundinaceum. Mistletoe Bird. — A few were observed, mainly in George's Creek, where the mistletoe is most prevalent.

Pardalotus punctatus. Spotted Pardalote.—Often seen and heard.

Pardalotus ornatus. Red-tipped Pardalote.—More often heard than seen.

Pardalotus melanocephalus. Black-headed Pardalote.—A few were noted.

Zosterops halmaturina. Grey-backed Silvereye.—Many fairly large flocks were observed.

Zosterops lateralis. Grey-breasted Silvereye. — Fairly numerous, especially in the Lantana, where they feed on the berries.

Melithreptus lunatus. White-naped Honeyeater. — The most noticeable of the Honeyeaters here.

Although the Banksia or Honeysuckle trees are conspicuous by their absence in this district, there is a great range of flowering trees and shrubs, which tend to give a greater variety of Honeyeaters than in southern districts.

Melithreptus brevirostris. Brown-headed Honeyeater.—Many were noted early in the year in the red-flowering tea-trees.

Plectorhyncha lanceolata. Striped Honeyeater.—A few were observed.

Myzomela sanguinolenta. Scarlet Honeyeater.—A lover of the red tea-trees, where its vivid plumage blends with the flowers. A few were seen early in the year.

Myzomela obscura. Dusky Honeyeater.—A few were noted. During my trip to the north-west last year, I noticed quite a number of these birds near Texas and Bonshaw.

Acanthorhynchus tenuirostris. Eastern Spinebill.—Not numerous, though numbers were seen feeding on the nectar of the Lantana flowers between George's and Lower Creeks.

Gliciphila melanops. Tawny-crowned Honeyeater. — Observed in many parts of the district.

Gliciphila indistincta. Brown Honeyeater.—Several were seen at George's Creek early in the year.

Meliphaga lewini. Lewin Honeyeater.—There appears to be a decided difference between the bird here and that of the Tamworth district, this bird being duller and having a variation in its notes. It feeds a great deal on the white cedar berries, swallowing the fruit whole.

Meliphaga virescens. Singing Honeyeater. — They were common when the eucalypts were in flower.

Meliphaga fusca. Fuscous Honeyeater.—Many were noted.

Meliphaga chrysops. Yellow-faced Honeyeater. — This little bird feeds closer to the ground than any other Honeyeater; it eats a great number of insects, as well as the nectar from the smaller-flowering plants.

Meliphaga leucotis. White-eared Honeyeater.—Have not seen one since the end of April, when numbers could be observed.

Meliphaga melanops. Yellow-tufted Honeyeater. — Early in May numbers visited this locality, and could be met with on all the creeks and the river, and, although their numbers have decreased, they are to-day, July 15th, the most noticeable Honeyeater on the river.

Meliphaga cratitia. Purple-gaped Honeyeater.—Many times noted.

Meliphaga penicillata. White-plumed Honeyeater. — Until June these birds were often observed, but latterly I have not seen any.

Manorina melanophrys. Bell-Miner.—There are many colonies in this district; one near the junction of George's Creek with the river being in a little brushy gully, half a mile from the main road.

Myzantha melanocephala. Noisy Miner.—Very few were to be seen here until the frosts drove them from the Tableland; they arrived about 9 a.m. on May 23rd in great numbers.

Anthochæra chrysoptera. Little Wattle-Bird.—When a swarm of bees settled on a limb of an apple-tree, numbers of these birds, in company with the Black-faced Cuckoo-Shrike *(Coracina novæ-hollandiæ)*, the Grey Shrike-Thrush *(Colluricincla harmonica)*, the Noisy Friar-Bird *(Philemon corniculatus)*, the Olive-backed Oriole *(Oriolus sagittatus)*, and the Grey Butcher-Bird *(Cracticus torquatus)*, devoured a great number. They flew into the swarm to disturb them. The bees left next morning, accompanied by a great number of birds. Their diet also extends to the fruit of the ink-weed.

Anthochæra carunculata. Red Wattle-Bird or Gill Bird.—Many observed eating dye-berries; numbers are still here.

Acanthagenys rufogularis. Spiny-cheeked Honeyeater.—When the dye-berries were ripe these birds were well in evidence.

Philemon corniculatus. Noisy Friar-Bird.—Quite a number about; also a lover of the dye-berry.

Philemon citreogularis. Little Friar-Bird.—Like his big brother, he eats dye-berries. It is not numerous.

Anthus australis. Australian Pipit.—Wherever there is a bit of ring-barked country, a few Pipits will be found.

Mirafra javanica. Horsfield Bush-Lark.—Like the Australian Pipit this bird is to be found in the ring-barked country. Many dark forms were noticed, also the other extreme of colour.

Zonæginthus guttatus. Diamond Firetail or Diamond Sparrow. — Very plentiful, and, with the Banded Finch *(Steganopleura bichenovii)* and the Red-browed Finch *(Ægintha temporalis)*, breeding all the year.

Tæniopygia castanotis. Chestnut-eared Finch. Arrived in numbers on April 28, but few were to be seen early in May.

Steganopleura bichenovii. Double-bar or Banded Finch.—There are numbers in the district; breeding at present.

Donacola castaneothorax. Chestnut-breasted Finch. — A few observed at Lower Creek.

Aidemosyne modesta. Plum-headed Finch. — A few arrived with the Chestnut-eared Finch *(Tæniopygia castanotis)*, and remained.

Ægintha temporalis. Red-browed Finch.—These little chaps are here in hundreds of thousands, and feed a great deal on thistle and summer grass seeds, thereby benefiting the farmer. I noted a great number at "Booth's" farm, George's Creek. A four-wire fence for over 200 yards had every available space occupied, besides the cornstalks and ground within a number of yards of the fence.

Oriolus sagittatus. Olive-backed Oriole. — Not common, but I noticed that they eat dye-berries, and white cedar berries. They helped to demolish a swarm of bees. They arrived about February 20th, and are still here.

Chibia bracteata. Spangled Drongo. — Two were observed on a spur fronting George's Creek Post Office, on the edge of a brush.

Ailurœdus crassirostris. Green Catbird.—Noted at George's Creek, Sunday Creek, Petroi, and "Lumeah."

Ptilonorhynchus violaceus. Satin Bower-Bird. — Observed eating dye-berries. Many were seen feeding on the fruit of the Stinging trees.

The Regent Bird *(Sericulus chrysocephalus)* has not yet been observed, although he is here.

Ptiloris paradiseus. Paradise Rifle-Bird.—I saw a few in brushes on George's Creek, Little Styx, Top Creek, at Gerygone, and Petroi Tableland. At the last-named place they were feeding on dye-berries, which grew there in profusion.

Corvus coronoides. Australian Raven. — Often seen, though not numerous.

Corvus cecilæ. Australian Crow.—Numbers took heavy toll on any corn planted in the district. They were also seen wherever the dye-berries were ripe.

Corcorax melanorhamphus. White-winged Chough. — Small flocks noted almost everywhere. They also fed on the dye-berries when in season.

Strepera graculina. Pied Currawong.—These birds are awful gluttons, and must consume a tremendous number of white cedar berries in a day. To get rid of the stones they drink a great quantity of water, which enables them to pass them with the excreta. I had an idea that they disgorged the stones, but with close observation was unable to prove that they did so.

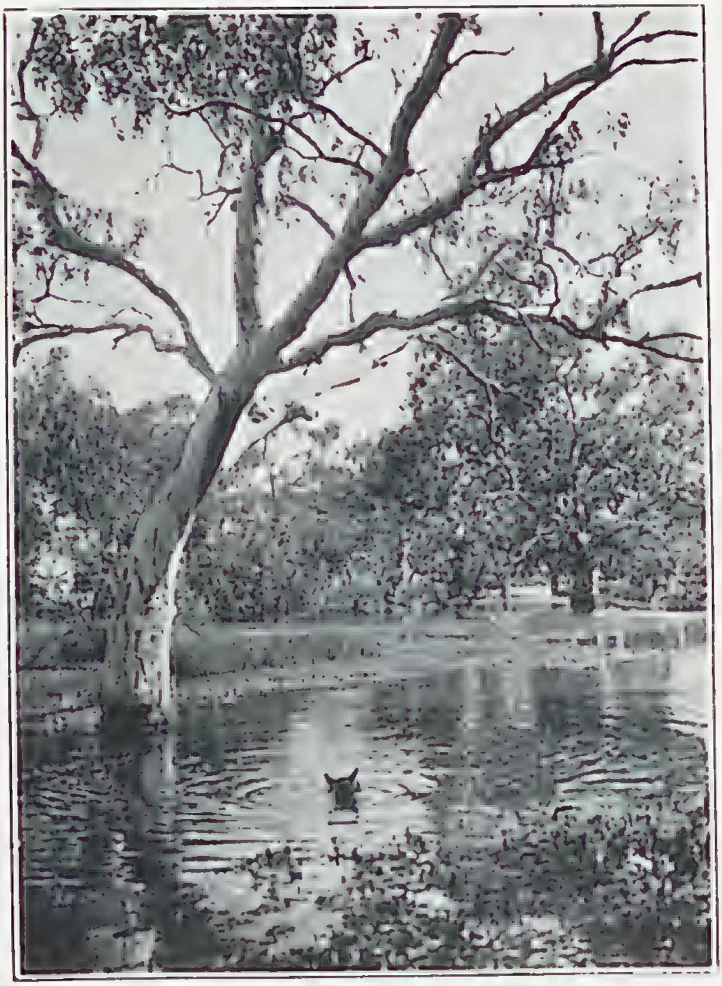
Cracticus torquatus. Grey Butcher-Bird.—Many observed.

The Pied Butcher-Bird *(C. nigrogularis)* is not here yet.

Gymnorhina tibicen. Black-backed Magpie.—In no way could one say they were common.

Gymnorhina hypoleuca. White-backed Magpie.—A few can be seen at George's Creek, "Riverview," and East Kunderang Station.

I have seen the Starling, House Sparrows, and Goldfinch of the introduced birds, which brings this list up to 197. Should I remain here over the spring, I should have little difficulty in noting 250 birds for the locality.



A View of the Lagoon, Yarraberb.

Photo by — Sargood, R.A.O.U.

A Typical Scene, Grass Lands, Yarraberb.

Photo by — Sargood, R.A.O.U.

Bird Notes from Yarraberb

By A. H. R. WILSON, M.A., F.R.G.S., Yarraberb Estate,
Raywood, Victoria.
Communicated by Dr. J. A. LEACH.

The writer has carefully studied the birds at Yarraberb, some sixteen miles north of Bendigo, during the years 1912-13, and again in 1927-28, and during the intervening period has twice resided there, but did not keep such copious notes. A great change has been observed in the numbers of various species during the sixteen years under review, which are worth recording, though the contributory causes are to some extent obscure.

In the first place, the annual rainfall from 1909 till to-day should be examined; the figures given are in inches to the nearest quarter of an inch:—

	Inches		Inches.		Inches.
1909	20	1916	26	1923	16
1910	19¼	1917	26¼	1924	20
1911	19¼	1918	22	1925	11¼
1912	17	1919	14	1926	13½
1913	22	1920	19¾	1927	11
1914	7	1921	23	1928 (till September)	16¼
1915	14¼	1922	10½		

The average rainfall at Yarraberb over 50 years is 17 inches, and it will be noted that during the three years preceding the 1912-13 period discussed, the average was over 19 inches (a clearly wet period), while for the five years preceding the second period it was under 15 inches. In other respects, the only change in local conditions has been a considerable increase in farming operations as against grazing. Perhaps some 10,000 acres of crops have been added out of an area of 100,000 acres over which observations have been taken, and the increase began in 1910.

The district requires little description. Some 500 feet above sea level, it is bordered on the east by an enormous low range of scrub and mallee almost uninhabited, nearly 300 miles long, but narrow; then comes open timber, mostly ringed, and, lastly, on the north begin the plains, with perhaps 500 or 700 acres of swamp.

The first bird which has decreased is the Budgerygah *(Melopsittacus undulatus)*. In 1912 there were thousands of these birds, varying in numbers only with the season. In the evenings they used to come in to roost over the garden in constant swarms. A visitor wanting to eat one as an experiment fired at one flock, and brought down seven at a shot. The paddocks and roads were alive with them by day. During the last 18 months, the writer has seen four Budgerygahs only, and has looked carefully for them. It should be noted that still these birds can find 50,000 acres of grass land to range over should they care to do so.

On the contrary, the Musk Lorikeet *(Glossopsitta concinna)* was a rare bird in 1912-13, two only being noticed. Last year and this year they increased, not sensationally, but over 100 have been seen. The Rosella *(Platycercus eximius)* was scarce in 1927, but the 16¼ inches of rain during the eight months of 1928 have recruited them up to normal.

Before leaving the parrots, it should be mentioned that one large flock of Quarrions *(Leptolophus hollandicus),* which used to frequent the district even up till 1921, always in the same paddock, has now vanished. This change may give food for thought and discussion, but should be examined in conjunction with the fact that our commonest and most ubiquitous parrot, the Red-Backed *(Psephotus hæmatonotus),* has remained equally common throughout the whole period.

Now, let us wander out into the swamp, with its red-gums *(Eucalyptus rostrata),* and constant supply of yabbies, or fresh-water crayfish, impervious to drought. In 1912-13 it was swarming with Ibises of all kinds, Spoonbills, Bitterns and Duck.

During dry periods, naturally, these birds leave for more attractive quarters, but the swamps were dry in 1912, and yet, after the first rains, the Ibises came in hundreds; this year conditions are equally suitable, but only the Ducks have returned.

One flock of White Ibis *(Threskiornis molucca)* stayed here for a day or two, but the Straw-neck *(T. spinicollis)* and the Glossy *(Plegadis falcinellus),* once the most common (especially the former, of course), have never returned.

All the commoner Ducks have remained constant, only showing the usual seasonal fluctuations, so well known to sportsmen. The two Spoonbills *(Platalea regia* and *P. flavipes)* have not deserted quite so noticeably as the Ibises, but are less in number. Egrets were never common, but now are absolutely gone; and it should be added that in 1921 little or no change had been observed since the 1912-13 period.

Two birds have increased steadily in the meantime — the Black-faced Cuckoo-Shrike *(Coracina novæ-hollandiæ)* and the White-fronted Chat *(Epthianura albifrons).* The former, which was mostly to be seen in the scrub country, has now become much more frequent in the open timber, and the Chats, seen originally only some 15 miles to the north-east, are now swarming all over the area. In both cases it is either merely an extension of range, or a definite increase, though both can be assumed to be identical, due, in fact, to increased population.

A definite extension of range can be claimed for the Goldfinch *(Carduelis carduelis),* but in this case the cause seems to be natural, the normal expansion of an imported species. The Goldfinch appears to migrate locally to the scrub in winter, and to the open farm land in early spring; but in both, or, rather, all seasons, the increase is obvious. This being a bad year for thistles, watch was kept to see if the Goldfinches would leave us, but such has definitely not been the case. It can be said with some degree of confidence that in 1913 the head of the main body of expanding Goldfinches had reached Castlemaine; now, in 1928, it is some 30 or 40 miles north of Bendigo.

At the same time, English birds, such as the Blackbird and Song-Thrush would, perhaps in smaller numbers (because they cannot stand extreme heat), have also pushed further inland. There were a few in Bendigo in 1912-13, and there they still remain; but not more than one of either has yet appeared on Yarraberb. Greenfinches also are absent as yet.

Next under review comes the Australian Reed-warbler *(Acrocephalus australis)*. This delightful neighbour was not seen in 1912-21 or 25, and the people in the district did not know the bird. It was still absent in 1927; but, now in August, 1928, the swamps are alive with their song. Want of observation cannot be held responsible, insignificant though the warbler may be. It is a clear case of sudden influx of a new species, whether on migration or not; and the writer expects to see them breeding and established.

It must not be thought that any of the cases mentioned are to be classed with the normal variations of wet and dry seasons—except the case of the Rosella. There have been many such examples, of course, for instance, the Banded Plover *(Zonifer tricolor)* and House Sparrow *(Passer domesticus)*, after the dry weather, which was only broken in late January, 1928. Both these species were rare; but the copious summer rain caused an abnormal nesting season in March and April, and both species have by now nearly recruited their numbers. The writer is in the habit of ringing young Plover. In September and October many are got in ordinary years, but he failed to find any in 1927 at that season, although he marked a good many in April. Now they are nesting again.

This is the natural result of the influence of rainfall on fecundity, and if birds can be said to be aware of coming rains, the Plovers are now indicating an excellent spring rainfall. The writer thinks this is fact, and expects to find it substantiated. In Scotland, he calculated the average clutch of eggs in several hundred nests, both in a wet and dry spring; the results were found to follow the precipitation closely, with a slight tendency to forestalling the conditions. He is not aware to what extent this investigation has been carried on in Australia.

Quail, Snipe, Ducks and Crows all conform to seasonal variations, as is well known, but the absence of the Budgerygah cannot surely be thus easily explained; nor can the observed increases during a dry period of five years. Smaller increases should be mentioned, which, though not striking, are yet definite; the casual observer might even fail to observe them.

The Diamond Firetail *(Zonæginthus guttatus)*, the Hoary-headed Grebe or Dabchick *(Podiceps poliocephalus)*, and the

Black-fronted Dotterel *(Charadrius melanops)*, have increased though all three species are, the writer thinks, more migratory than is supposed, the last perhaps to the greatest extent. All these species are very welcome.

Similar, lesser variations in population, but representing a decrease, are seen in the Restless Flycatcher *(Seisura inquieta)*, never common, but now almost absent, and the White-winged Triller or Caterpillar-eater *(Lalage tricolor)*, equally conspicuous by its absence.

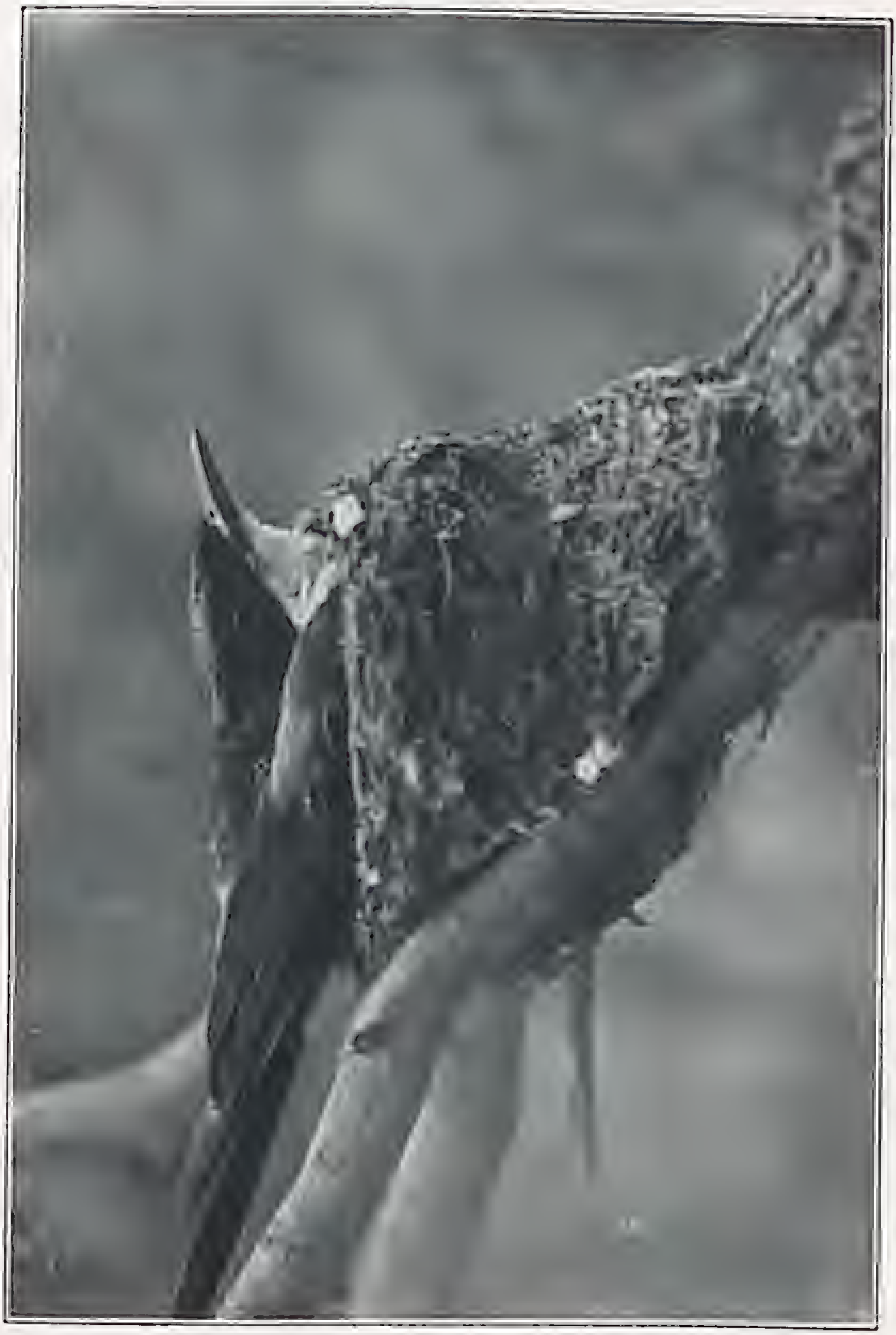
These are the main changes, and they naturally led to an examination of the Hawks to see if these birds had followed suit in any way in sympathy. The result was negative; conditions remained normal, with one exception that fewer Nankeen Kestrels *(Cerchneis cenchroides)* were there than formerly.

The causes must be left to others to examine, but an interesting case of breeding after rain is worth noting in detail. A pair of Welcome Swallows *(Hirundo neoxena)*, probably the same pair each year, are in the habit of nesting in a summer-house here. In August, 1927, they failed to repair their nest, but in February they did so and reared a brood, and only waited one week before a second clutch was begun to be successfully released. One dead youngster was left in the nest. In July, 1928, they built a superstructure over the body, and a new brood will shortly leave the nest. One can look for a fourth brood by October. The year 1927 was one of few mosquitoes, few flies, and fewer moths, but the rain brought a plague of all these things; mosquitoes became almost unbearable, and even in Melbourne the myriads of moths about the month of March, 1928, will be remembered. Every patch of grass was swarming with moths, and each footstep would raise a cloud.

It would seem that this was partly due to a shortage of birds after the successive dry years; at the same time no increase by immigration or increased fecundity seemed noticeable to cope with the scourge. This could have been expected; re-action was slow.

Some of those who read this may remember how the mad old lady caused a serious loss to the fruit crop in a large district in England. She had what might be called Felophobia, and in secret poisoned or otherwise destroyed all the cats in the neighbourhood, and an immediate increase of mice followed. That resulted in the benefit of the Owls and Hawks, who neglected the Bullfinches and lesser robbers of the fruit trees. The birds were able to frequent the open, and partially destroy the crop.

A second example of how causes may often be obscured is how a certain wild flower left a Scottish village because of a dog. Again we find the cat. The dog killed all cats on sight; the survivors fled, or were kept indoors. Now there were two pairs of the rare Honey-Buzzard, which stays near the hives and eats the bees in swarms. So intent is the bird that a cat can catch it when at work, which now was obviated. The bees decreased,



Restless Flycatcher (*Seisura inquieta*) on nest.

Photo by Marc Cohn, R.A.O.U.

and their keepers sold the hives, with the result that the flowers which depended on pollenisation on the legs of the visiting bees failed to fertilise, and so became extinct. This is an old story, and is also told of another bird and the Bumble-bee, but its germ of truth remains the same.

The study of plagues, their causes, rotation (regular or not), and inter-action is difficult, and still open to fruitful study. Largely, it will be found perhaps in a study of monthly rainfall; as, for instance, in the case of Quail. A dry September will result in low fecundity, but at the same time a high fecundity can be nullified by a flood in October, which will drown the young birds.

That is clear, and yet what caused the plague of moths in March, 1928? To begin with, nobody ever mentioned a plague of caterpillars just before the moths appeared. The writer at any rate failed to observe any such event. It is reasonable to assume that in due course there will appear the caterpillars descended from these moths; it should be looked for, but possibly no such thing will occur; perhaps some fortuitous frost, some wet or dry week, may have saved us; but in any case, the absence of caterpillars will be there for reasons absolutely obscure. On the other hand, they may appear in millions.

After this pseudo-digression, it will be amusing to see if any theories can be suggested to account for the fluctuations in birds on Yarraberb. It may be traced to a bad-tempered bull, but one looks for a less fanciful cause. It is worth mentioning in passing that the fish in the creek near here have been exterminated by the mines in Bendigo.

Before closing this part of the paper, one or two bird-notes, in a small way connected with our subject, may be of interest.

The Native Companion or Australian Crane *(Megalornis rubicunda)*, years ago common on the plains, seemed to be doomed to follow the Emu into oblivion, but such is not yet the case; a few remain on the larger swamps, some miles away from the district, covered by this paper.

Some months ago the writer reported seeing a Bustard *(Eupodotis australis)* on the plains; they were thought to be extinct for miles round. It was suggested laughingly that he had mistaken it for a Snipe, or an overfed Thornbill, at any rate he was disbelieved; but two weeks later a farmer found it in his crop, and to satisfy himself as to his state of health, because after all whisky is less potent these days, he went home for his gun, and shot it. He had lived here all his life, and had never seen one, and thought it was a new domestic fowl. It seems that this splendid bird could be made to extend its range with careful protection, now only nominal.

One evening in July, warm and still, there was to be seen an interesting study of the bathing of the Greenie, or White-plumed Honeyeater *(Meliphaga penicillata)*. Down by the creek suddenly one of these Honeyeaters flew on to the water, half submerged itself, and then retired to a branch to shake itself; in one minute some dozen could be seen. Along half a mile of water were scores of Greenies, all diving, more or less courageously under the surface.

Some quarter of an hour later, they all ceased this activity together; each one had dived many times. The observation is of course in no way unique, but the synchronisation of so many birds in starting and finishing the operation was most striking. It should be added that no other species of bird followed their example.

The writer will be away for perhaps two years, and a further study may yield more results after a lapse of time; but to ask the people who live in this district to make interim observations would only give unreliable results. Firstly, because their identification is often doubtful, and, secondly, because gradual changes are less obvious than those seen after a lapse of time when coming fresh on the accustomed scene.

The second part of this paper deals with the highly-developed land-ownership sense in birds, and is to some extent correlated to the foregoing.

The laws of supply and demand, of economic balance of population to food, are of as much importance to birds as to man. Is not the whole scheme of migration, and nomadism, due fundamentally to food supply?

The writer has conducted experiments with the so-called stationary species in Scotland, which could be continued in Australia, and have to some extent already been observed. In the course of trapping adult birds for ringing purposes, the writer rather specialised on two British species—the Redbreast *(Ericathus rubeculus melophilus)* and the Hedge-Sparrow *(Prunella modularis occidentalis).* It was discovered that these stationary species, though mingled with a leaven of Continental birds, which annually came over from France, or further, were so strongly imbued with the spirit of land-ownership that a pair would never move out of an area, perhaps only half an acre in extent. Robins A and B, for instance, were caught daily on one side of the house, while C and D never left the other side. Only twice a year in spring and autumn was there a sort of false migration, when the pairs of each season re-shuffled themselves, and moved perhaps 200 yards.

The Hedge-Sparrow will drive out by force any invader of his domain, and on several occasions when the owner of a territory was detained in the trap, awaiting release, a stranger was able to wander unmolested into forbidden places: but if, as sometimes occurred, the invader joined the owner in the trap, the owner killed his enemy by pecking out his brain.

There are many instances of this, but no bird ever killed one of another species. Now, if this was fact, and no adult of either species has ever been discovered at a distance from his home, what happens to the fledged youngsters?

The writer marked over a hundred adults, and perhaps forty young birds. It is significant that never was a single one of the rising generation caught in the local traps. In fact, the parents, having reared their brood, drive their children away. Each place they try to settle in is already occupied, so the poor young thing continues to wander further and further till at last he or she finds a mate which has lost its spouse by death in some form or other. Nature's laws are no more perfect than ours.

Proof of this was not long in coming; of the forty young birds ringed, in due course two were re-captured, but not by the ringer near their own home; one was caught 37 miles away to the north-east, and the second 20 miles due east. Both had followed the course of a river, while one had subsequently continued along the sea coast. It may be Nature's method of preventing in-breeding; at least, it must have that effect.

That is the proved system of solitary species; what of those which are gregarious? Investigation is more difficult, but experiments were tried with the Greenfinch *(Ligurinus chloris)* and Chaffinch *(Fringilla cœlebs cœlebs)*. Results were less conclusive, but it would seem that territory is less proprietary, and communism is practised.

As an example, two male Chaffinches were caught together in a trap one day, and marked. Exactly two years later, to a day, the same two males were re-caught together in the same place. Greenfinches also were found to re-visit traps after long intervals. Both species feed in flocks of both sexes, and roost in vast hordes nightly in the same place. How in-breeding is avoided among them, we do not know; perhaps it is not discouraged, as in the Quail, which keep together as a family, and must, we think, in-breed freely from want of a wider choice.

It is often held that the reason why shooting does not seem to diminish the numbers of Quail, and their cousins—the Partridge—is because the alarm of the guns tends to split the coveys, and force an out-cross of blood upon them. There is probably much truth in this. The whole subject requires more study, and it is fascinating, even having considerable economic importance in the question of human food-supply.

Now, in Australia, the writer has done no trapping experiments, but others can always begin. He has, however, observed the working of the same laws among solitary, stationary species. He has seen the Australian Magpies *(Gymnorhina)* evicting their young when ready to live by themselves, and the Tree-Creepers all show the same tendency. The nomadic, semi-gregarious species, such as Honeyeaters, while wandering to places where the Eucalyptus is in bloom till a new supply is demanded, are imitators of the Chaffinch. The sight, common enough, of Greenies fighting in the air may be due to mating rivalries, or to the expulsion of the family; it is a bold man who will say which.

The migrating species, as against the nomadic, have not been discussed, but, broadly speaking, the young birds move first, and the parents as a rearguard; and one can assume with the hazards of wind and dark, cloud and fog, that the families lose touch with each other, and intermingle till in-breeding is difficult.

The writer in occasional papers in *The Emu* has now and again suggested avenues of exploration in bird-study. He wonders if anyone has had the interest or leisure to follow such ideas.

Having concluded this paper with the last sentence, the writer went out by car to one of the swamps, and there, to refute one of his statements, was a flock of 21 Straw-necked Ibises, the first seen for 18 months. Whether they remain must be left to future observation to determine. They have already moved on.

The Validity of the Generic Name *Aestrelata.*

By W. R. B. OLIVER, C.F.A.O.U., F.N.Z. Inst., Dominion Museum, Wellington, N.Z.

Among the changes in generic names introduced by Mr. G. M. Mathews for Australian birds was *Pterodroma* in place of *Æstrelata.* The latter name had been in general use for upwards of 50 years for a large number of species of world-wide distribution. It had, therefore, become firmly established in ornithological literature, so that its suppression in favour of one that had never come into general use caused a good deal of confusion and annoyance. Had the change been made in accordance with the principles or laws of zoological nomenclature it must have been accepted. The evidence given by Mathews for the change, however, proves that *Æstrelata* was legally retained by Coues when uniting some of Bonaparte's genera.

The history of the case as outlined by Mathews *(Birds of Australia,* Vol. 2, p. 131, 1912) is as follows:—Bonaparte in *Camptes Rendus,* Vol. 42, p. 768, 1856, introduced both *Pterodroma* and *Æstrelata*, *Pterodroma* appearing first on the page. In the following volume *(Comptes Rendus*, Vol. 43, p. 994, 1856) he introduced *Cookilaria* in place of *Rhantistes*, which was preoccupied.

Coues *(Proc. Acad. Nat. Sci.,* Philadelphia, 1864-66) united these three genera and selected *Æstrelata* because it appeared first in the *Conspectus Genera Avium* of Bonaparte, which Coues thought was issued prior to *Compt. Rend.,* Vol. 42; in reality it did not appear until 1857.

Mathews, pointing out that *Pterodroma* stands first on the page in the publication in which it first appeared, and quoting the principle on which Coues worked, substituted on the same principle *Pterodroma* in place of *Æstrelata*. As it stands, his argument is plausible, and it has been generally accepted. It is, however, futile and contrary to both the principles and rules of the Zoological Code. Had Mathews quoted Article 28 he would have had no case, and the desired change in name could not have taken place. It matters not on what principle Coues selected *Æstrelata,* for the rule does not mention the manner of selection but merely the fact. Article 28 reads as follows:—"A genus formed by the union of two or more genera or subgenera takes the oldest valid generic name of its components. If the names are of the same date, that selected by the first reviser shall stand." Clearly Coues selected *Æstrelata* in accordance with this rule, and his revision, being the first, must stand. Recommendation C to Article 28, which contains the principle on which both Coues and Mathews worked, applies only in the absence of any previous revision. A precedent may be quoted for the construction of Article 28 in favour of the establishment of *Æstrelata* in preference to *Pterodroma* in opinion 40 of the International Commission on Zoological Nomenclature, which opinion, however, deals with species, not genera.

So-called Bird Pests

By ARTHUR C. V. BLIGH, R.A.O.U., Brookstead, Queensland.

I was interested in the observations concerning Starlings in *The Emu* of April last, and in Mr. H. Piggott's letter. I agree that the habits not only of Starlings, but of many other birds that are considered as pests should be more thoroughly investigated before their classification under the heading of pests.

As a member of a board which exists for the control of pests in Queensland, I cannot help emphasising the opinion that too little is known in connection with many of these designated pests, for which a bonus for destruction is often paid. Their uses often outweigh their abuses. Locality often alters this aspect, through industries being different, etc. We are, as a board, continually having to change our verdicts against these supposed pests, until I personally am convinced that practically all the so-called pests whose destruction is paid for, have a balance, which invariably gives a credit against the debit. In fact, I am left with one exception only, and that is the flying fox, or large fruit-eating bat. It may have good qualities, but I am not aware of them. The Starling is undoubtedly a curse in some districts, more especially where fruit and wheat are grown, but it must be admitted that it is a destroyer of insect life in many forms. In New Zealand, the Grass Beetle threatened the planted grasses, more especially Rye Grass, but the Starling beat the Beetle. I have seen Starlings clean up grasshoppers in the hopper stage, and I have seen them take ticks from cattle and sheep in the tick areas of Queensland. It must be admitted that their natural diet is insect life, but unfortunately they like fruit and grain, in which most of our birds seem to join them.

I am not arguing for the Starling to be preserved in any way—its faults may far outweigh its virtues—but we know so little of the life habits of these birds under different locality conditions that it seems that exhaustive enquiries should be made before we enter them in the lists for destruction, especially with a reward for their scalps. They certainly should be destroyed in the fruit areas. But what about the cattle tick areas? It has been our experience as a board, when enquiring as to the advisability of rewarding destruction of different supposed pests to be given very strong arguments for and against them, leaving us very undecided generally. For instance, a few years back we paid one shilling per head for crows. We instituted enquiries as to this bird pest, and practically stopped paying for them, on the evidence received. Some authorities, notably Mr. White, of Belltrees, Scone, could not condemn this bird sufficiently; in fact, to look for a good quality was a sin. While, from the sugar plantations, however, the report was nothing but good. There its destruction (owing to the work it does with the cane grub) would undoubtedly be a sin. Anyway, the crow won out, and seeing it has been with us since the days of Captain Cook (and I do not think it has increased greatly), one must admit perhaps this was right.

Personally, I think the suggestion in *The Emu* referred to as to the making of very exhaustive enquiries into the life and food of these birds would be an immense advantage to our country.

Albinism in Birds.—A very interesting case of albinism came under my notice in July. Among a flock of the small Yellow-tailed Thornbills *(Acanthiza chrysorrhoa)* feeding in a grass paddock, was one which was almost pure white in plumage. The head and mantle had a slightly darker shade, but the wings, under side of body and tail were white, giving the bird a very curious appearance amid its darker mates. The upper tail coverts, which are bright yellow in the usual plumage, were a pale whitish-yellow in this individual. In over 30 years' experience with our native birds, this is the first instance of albinism I have met with in the Thornbills of the genus *Acanthiza.*—H. STUART DOVE, F.Z.S.—*Mercury*, Hobart, 19/7/28.

Some Birds of Mount Tambourine, South Queensland

By Mrs. BLANCHE E. MILLER, Lambeth Place, St. Kilda.
Communicated by R. T. LITTLEJOHNS, R.A.O.U.

The motor drive from Brisbane to Mt. Tambourine, a distance of approximately 45 miles, is full of interest to the visitor from the southern States, as it prepares one for the totally different class of country on the Mount, which is 2000ft. above sea-level. Unfortunately for the bird-observer, the roads afford such excellent travelling that one gets but a swift glance at the bird-life seen *en route.*

Welcome Swallows *(Hirundo neoxena)* and Magpie-Larks *(Grallina cyanoleuca),* Black-backed Magpies *(Gymnorhina tibicen),* and Kookaburras *(Dacelo gigas)* were seen frequently. The favourite site for the large, unmistakable nest of the Magpie appeared to be on branches arching over the roadway, many nests so placed being observed. Occasionally one heard a Crow *(Corvus cecilæ),* and numbers of Crimson Rosellas *(Platycercus elegans)* flew with noisy screeching on the approach of the car. A White-faced Heron *(Notophoyx novæ-hollandiæ),* commonly but erroneously called a "Blue Crane," wading in a small stream, and a Sacred Kingfisher *(Halcyon sanctus)* in an adjacent tree, were added to the list quite early. Later a pair of Glossy Ibises *(Plegadis falcincellus)* and a Nankeen Kestrel *(Falco cenchroides)* were seen. Nearer the foot of the Mount, and just before crossing the railway line, a large lagoon gave promise of numerous forms of water-fowl, but a scheduled time-table did not permit of a close inspection.

Although the ascent of Mt. Tambourine reminds one somewhat of the Dandenong Ranges of Southern Victoria, it could scarcely be more unlike. The colourful Lantana is as serious a pest as the Blackberry is in Victoria; and every little water-course was gay with the Wedgwood blue of *Ageratum.* Both are serious pests in Queensland, but are considered desirable garden plants in the southern States, and are cultivated even in the Brisbane Botanic Gardens.

By far the most common birds at the settlements at Eagle Heights were the Pied Currawong *(Strepera graculina)*; the Welcome Swallow *(Hirundo neoxena)* busily building under verandahs and eaves; and the Dusky Wood-Swallow *(Artamus cyanopterus),* a bird of ashy-grey. Flying from post to post, the black centre tail-feathers of this bird were most conspicuous, the white tips of the remaining tail feathers giving the illusion of a forked tail. Although the Pied Butcher-Birds *(Cracticus nigrogularis)* were noticed frequently in the day-time, it was in the early morning that their four distinct, rich notes were heard; they reminded one somewhat of a piano-tuner harmonising notes.

It was while looking for the Albert Lyrebird *(Menura alberti)* that a male Brush-Turkey *(Alectura lathami)* was first noticed, high up in a tree, in a gully, where Walking-stick Palms grew like standard roses. Yellow Robins *(Eopsaltria australis)* were numerous, and, in more open country, the Golden Whistler *(Pachycephala pectoralis)*, the Fan-tailed Cuckoo *(Cacomantis flabelliformis)*, and a Black-faced Cuckoo-Shrike *(Coracina novæ-hollandiæ)* were seen.

In the scrub, the predominating bird-call was the sharp crack of the Eastern Whipbird *(Psophodes olivaceus)*. Strangely enough, one can be quite near these interesting birds and yet not distinguish them. The thick scrub, especially the Lawyer-vine or "Wait-a-while," as it is called locally, precludes the possibility of following up the call. However, paradoxical though it may sound, once the bird is actually observed, it is possible to see it quite easily. Sitting quietly one day, the writer was delighted to find a pair of Whipbirds almost within touch, and apparently oblivious that anyone was near. The one that appeared to be the female raised her bill slightly, and called softly at first, but each succeeding call louder, "Coo-coo-coo-co-o-o-o," dwelling on the last "coo" until her mate answered with the familiar whipcrack. While doing so his crest was slightly raised, the fan-like tail described an almost complete half-circle, the wings were lowered, much as a domestic cock does when in fighting mood, and the bird jumped with the vehemence of the call. Nearby, still another bird answered "Chick Chick." The calls were repeated many, many times, so that there was ample evidence that the first impression was not a mistaken one. Occasionally, there were two whip-cracks; one from the bird actually under observation, and the second from a bird in the scrub; and the succeeding "chick chick" was sometimes a single note. The "coo-coo" was certainly very definite; generally three, occasionally four, or even as many as five "coos" were counted. From a distance this call sounds more like one long in-drawn note.

Many birds have purely local vernacular names. "Devil Bird" is shared by the Yellow-throated Scrub-Wren *(Sericornis lathami)* and the Grey Fantail *(Rhipidura flabellifera)*; while the name "King Bird" is given to the Eastern Shrike-Tit *(Falcunculus frontatus)*, "because," the children say, "he wears a crown"! Not always are the pet names so apt. There is a large Pheasant-tailed Pigeon *(Macropygia phasianella)*, a most graceful bird, cinnamon and brown, the nape glowing with indescribable colour, and nicknamed "Brownie." Possibly, the name "White Lug" given to the Yellow-eared Honeyeater *(Meliphaga lewini)* is a name that will yet be heard in other States. Although an insect- and honey-eater, " White Lug " has acquired a fancy for oranges, piercing the outer skin, and eating the inside. Unfortunately, it damages a great deal more than it actually eats, and is regarded as a serious pest at Mt.

Tambourine, where the growing of citrus fruits is one of the staple industries. This Honeyeater has a peculiar undulating flight when flying upwards, and "dives" with closed wings in a most fascinating way, for quite a long distance, when coming down. The word "dive" is used advisedly. The movement is suggestive of a well-trained swimmer diving from a height, and is totally unlike the alarming "fall" of the Skylark or the studied "volplane" of other birds. "White Lug" seems to have constituted himself the busybody of the scrub. As surely as one heard the harsh, quavering call, rather like the call of a cricket unduly prolonged, just as surely would the smaller scrub birds become silent, and vanish from sight miraculously.

Of small birds there were many. Brilliant little Diamond Firetails *(Zonæginthus guttatus)*, modest Brown Thornbills *(Acanthiza pusilla)* and Little Thornbills *(A. nana)*, remarkable for their peculiarly strong notes, considering their lack of size. Of Grey-backed Silvereyes *(Zosterops lateralis)*, there were scores. In equally large numbers were charming little Red-browed Firetails *(Ægintha temporalis)*, tiny little birds, which build such elaborate nests, in which their six or seven babies are reared. No wonder they are always busy! One can imagine no prettier sight than a large flock of Firetails round a drinking saucer placed for them. They tested the depth of water with one foot before performing their morning ablutions. Still more attractive, in a quaint way, is the Orange-backed Wren *(Malurus melanocephalus)*, a wee, little body, scarcely the size of a ping-pong ball, of richest black plush, with decorations of brilliant tangerine, tiny bill, and a fine tail, unduly long, placed at a grotesque angle. Such is the male, but the females are very plain little birds of greyish-brown.

It was a joy to see the bower of the Satin Bower-Bird *(Ptilonorhynchus violaceus)* within a stone's throw of a habitation. This Bower-Bird has a special fancy for using blue objects for decorating its playground, and in this particular instance the blue flowers of the native Tobacco-bush and blue feathers of the Eastern Rosella had been utilised. Some time previously, this bower had been inadvertently destroyed and reconstructed by humans. The male bird, with many scoldings, removed practically every little twig, and replaced them at an angle to suit himself.

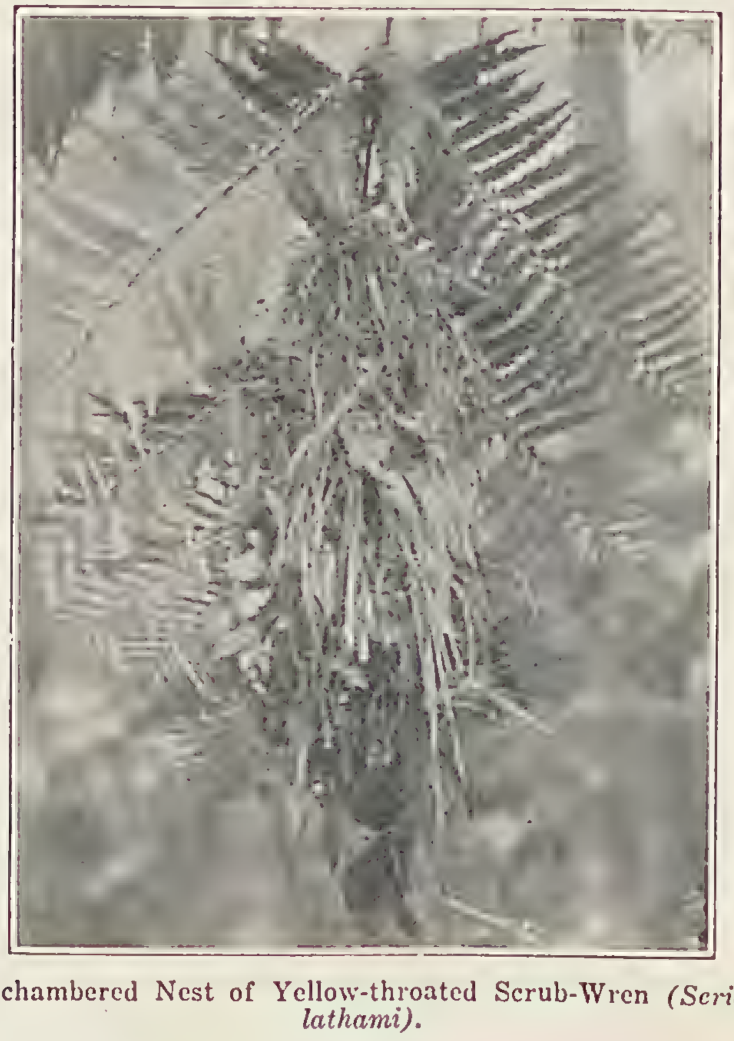
The beautiful black and orange Regent Bower-Bird *(Sericulus chrysocephalus)* was unfortunately not seen.

The Green Catbird *(Ailurœdus crassirostris)* usually proves of interest to visitors not otherwise interested in birds. That is, when they realise that the harsh sound is made by a bird, and not by a cat. Occasionally, one might mistake the call for the startled cry of a newly-awakened child. It was interesting to find this observation verified in an extraordinary way; a very excellent bird-observer, who daily heard the Catbird's call, mistaking it for that of her own babe!

Yellow-Throated Scrub Wren

By MASTERS A. J. and A. O. ELLIOTT, Cambewarra, N.S.W.
Communicated by Mr. ROY KINGHORN, C.M.Z.S., Australian Museum, Sydney.

While out for a long ramble on Sunday, 13th May, 1928, in search of Lyrebirds' "dancing mounds," of which we found about two dozen, we discovered a three-chambered nest of the Yellow-throated Scrub-Wren *(Sericornis lathami)*. This we have since forwarded to the Australian Museum, Sydney. The nest was composed of three separate egg-chambers and openings, of which all the latter could be seen from one side. Portion of another nest was built at the lowest end. This portion was within 4 or 5 feet of the ground, and had possibly been de-



Three-chambered Nest of Yellow-throated Scrub-Wren *(Sericornis lathami).*

Photo by Masters A. J. and A. O. Elliott.

stroyed by foxes, though the birds may have commenced to build and not completed it. The whole clump of nests was attached to a twig of a tree, locally known as a "brush mahogany," which, from our observations, seems to be a favourite tree for the nesting sites of these Scrub-Wrens. Six or eight feet from the nest mentioned above, was a two-chambered nest of the same species. This nest was seven or eight feet from the boulders which lay under it, this particular gully being very stony and rough.

We collected the two-chambered nest also, but, the way home being rough, it was badly damaged. We have on former occasions found two-chambered nests of the Yellow-throated Scrub-Wrens. Both egg-chambers had separate openings in every case.

Of Yellow-throated Scrub-Wrens in general, we may say that they are very common in the mountain brushes about here. In the mountain gullies near our home at Cambewarra, we find dozens of their nests each year. We have never seen a nest at a height of more than ten feet. Mostly they are at about six feet or less, and are often suspended over water. Many nests are destroyed by foxes and other pests every year. One nest which we found this year was suspended from a tree-fern frond. We photographed this nest on January 26th, when it contained three eggs. Another nest which we discovered a few years ago held two eggs; one was a normal egg of the Yellow-throated Scrub-Wrens, red-brown in colour, with darker markings at the large end, and larger than one would imagine these birds to lay; and the other was smaller, and white in colour, thickly speckled with dark brown, especially about the larger end, where the specks formed a zone. This was evidently the egg of one of the cuckoos. We have kept both eggs as a reminder of those egg-collecting days.

Adult Yellow-throated Scrub-Wrens appear to keep quiet during the winter time, but in spring and summer they can be seen and heard in all the mountain gullies which we have explored in this district. They are also comparatively good mimics of the calls of other small birds.

A photograph taken by us of two young "Yellow-throats," although far from excellent, has the distinction of being the result of the first exposure which we made with anything from nature as the subject, and is the fifth plate which we exposed. Our previous knowledge of bird photography was formed from a detailed study of "Birds of Our Bush," by Messrs. R. T. Littlejohns and S. A. Lawrence, to whom we are greatly indebted. We acquired our camera at the last new year, and have not yet had any opportunity of photographing an adult "Yellow-throat," but during the next nesting season we hope to remedy this.

Bird Notes from Walpole Island

By C. S. SULLIVAN, M.B., B.S., Warrnambool, Vic.

The following facts were communicated to the writer by Mr. T. G. Bryant, a Warrnambool resident, who formerly spent some years on Walpole Island. This tiny speck of land contains an area of only 320 acres, and its nearest neighbour is New Caledonia, some 150 miles to the north-west. A coral island, overlaid with phosphate deposits, it is nevertheless very precipitous, rising, as it does, 300 feet sheer from the Pacific Ocean. The island must have suffered a long, slow process of immersion, while the coral polyps worked away quietly below the surface. A succeeding process of elevation, possibly gradual, possibly sudden, has raised the island to its present position. The vegetation consists mainly of stunted undergrowth, but the banyan, the custard-apple, and a species of palm are also represented. The following observations were made between 1920 and 1923, and though few in number, may not prove altogether devoid of interest.

Firstly, a word as regards some absentees. No petrels nested on the island, nor were albatrosses, cormorants, or gulls ever observed in the vicinity.

1. An occasional visitor was a large dark-coloured Pigeon, a resident of New Caledonia. It was seen on the island five or six times only.

2. The Frigate-Birds *(Fregata sp.)* came back each breeding season in the wake of the Tropic-Birds. They appeared to live mainly as robbers, stealing fish from the Tropic-Birds, especially the Red-tailed species, which was slower on the wing than its White-tailed relative. The flight of the Frigate-Bird was marvellous to watch. The bird would forge ahead against a strong wind, without any perceptible movement of the mighty wings. From Mr. Bryant's description, I think the species at Walpole Island was the Greater Frigate-Bird *(Fregata minor)*.

3. Two kinds of Gannets *(Sula sp.)* nested on the island, and were practically the only permanent residents among the avifauna of this isolated spot.

4. The Red-tailed Tropic-Bird *(Phaethon rubricaudus)* and the White-tailed Tropic-Bird *(P. lepturus)* were seen during the breeding season only. Only a few hundreds of the latter species came in, but the numbers of the Red-tailed Tropic-Bird would run to several thousands. These nested on top of the island, but the White-tailed species, much more wary, nested in the crevices in the sides of the cliffs.

5. Noddies *(Anous sp.)* arrived each year, and would be first seen as black clumps out on the sea. The following day, they would come in and commence nesting operations in the bunchy tops of the palm-trees.

6. Of the migratory Waders, only one species was seen. It nested at the same time as the other birds, i.e., during June, July and August. The nests were not *made,* but rather *selected* by the birds, being merely small depressions in the coral, covered with a low growth of "hogweed." As to a description of the eggs and the size of the clutch, my informant cannot give accurate details, owing to the fact that at the time he was not deeply interested in the study of bird-life. But he says that there is no doubt at all about the birds breeding there. They were quite tame, and would bring the young over on to the guano drying-grounds, where they were easily observed.

And now, what *was* this Wader? My informant says it was the "Jack Snipe," the same bird that he has shot on Victorian swamps. From the illustrations in Dr. Leach's *Australian Bird Book,* Mr. Bryant identifies it as the Sharp-tailed Sandpiper *(Erolia acuminata).* Only a few hundreds of these birds nested on Walpole Island, and no observations were made as to the direction of flight, either on their arrival or on their departure. Could they have been portion of the New Zealand contingent of the Waders, a portion that, maybe, does *not* regularly repair to the Siberian tundras to breed? I leave this for other observers to discover. Specimens sent from Walpole Island for identification would help to settle a rather intriguing question.

7. Occasionally a Hawk, similar to our Brown Hawk *(Falco berigora)* would arrive and remain on the island a week or two, living meanwhile on the rats, which were quite numerous.

8. Once, during the hurricane season (January to March), a small flock of (?) Diamond Firetails *(Zonæginthus guttatus)* landed on the island, but did not stay very long. I am not certain of this identification. Mr. Bryant describes it as the "Java Sparrow," the same bird that he knew on the Murchison River, W.A.

9. On one occasion, a Starling *(Sturnus vulgaris)* arrived in an exhausted condition. It was picked up and was given water, of which it drank freely. It soon revived and flew off into the scrub, but was not seen again. On another occasion, a flock of about twenty arrived, tired but not exhausted. They stayed four or five days before departing.

9. To complete this short list, I must step outside the Class AVES, and mention two Flying Foxes (fruit-eating bats), which, for a short time, stayed on the island and then left, without announcing whence they had come or whither they were going. They are very numerous in New Caledonia.

Bird Migration in New Zealand

By Mrs. PERRINE MONCRIEFF, "The Cliffs," Nelson, N.Z.

The following paper has been compiled from the replies received in answer to a questionnaire sent through the Dominion, in 1926. In dealing with this subject, the writer has endeavoured to divide N.Z. into areas, and record the movements of birds observed therein.

As will be noticed, more information has been received from some areas than others, and unfortunately a large portion of the east coast of the North Island remains a blank. This is somewhat serious, as in compiling such a paper, all territory should be under observation, for it renders accuracy more certain. The writer is fearful to state that a certain species of bird has left New Zealand when it may have moved into one of the blank areas, though recorded as absent everywhere else.

To answer the questionnaire sent out has not always proved an easy matter to the recorders, who, desirous of being of assistance, have allowed their replies to turn into a record of the birds present with no indication of their movements, such as in the reply: "Very plentiful in this area," giving no indication as to whether the birds move in winter and autumn. The writer fully appreciates this difficulty, and has always included the information as, at any rate, proving that the bird alluded to is present in that area.

At the same time a great deal depends on the recorders, whether they have noticed birds and facts accurately. Because a certain bird is not recorded from a particular area, it does not necessarily follow that such a bird is absent. It may have been overlooked, or, what is more likely, is present elsewhere in the area, but not actually in the vicinity from which the correspondent writes.

It is therefore dangerous to draw too certain conclusions from the information received, but this paper is the framework whereon to build further observations on migration. Like a scaffolding, it is of necessity very rough, and in time can be pulled down for something better, but without a beginning there can be no finished work.

Where one or more recorders have been in agreement, the writer has been able to check her facts with her own observations.

This paper has been divided into:—

(1) A map of the Dominion divided into areas from which records have been received, numbered numerically in the North Island, and alphabetically in the South Island.

(2) Notes on the type of country to be found in the various areas of the North and South Island.

(3) A summary of evidence received on the endemic and introduced birds from each area. In it the writer has endeavoured to draw conclusions as to the migratory habits of each species from the data received, giving their food.

(4) A table of these birds, placed into different sections according to the amount they migrate.

(5) A list of the different species of birds recorded as "present" in the different areas, during the years 1926-27.

(6) Data received on albinoism amongst N.Z. birds.

It will be noticed in (4) that the writer has experienced some difficulty in deciding into which section some birds should be placed. And it will doubtless come as a surprise to most people to find that practically all N.Z. birds are more or less migratory. That is to say, that out of the 82 birds named in the list, only 19 are truly stationary.

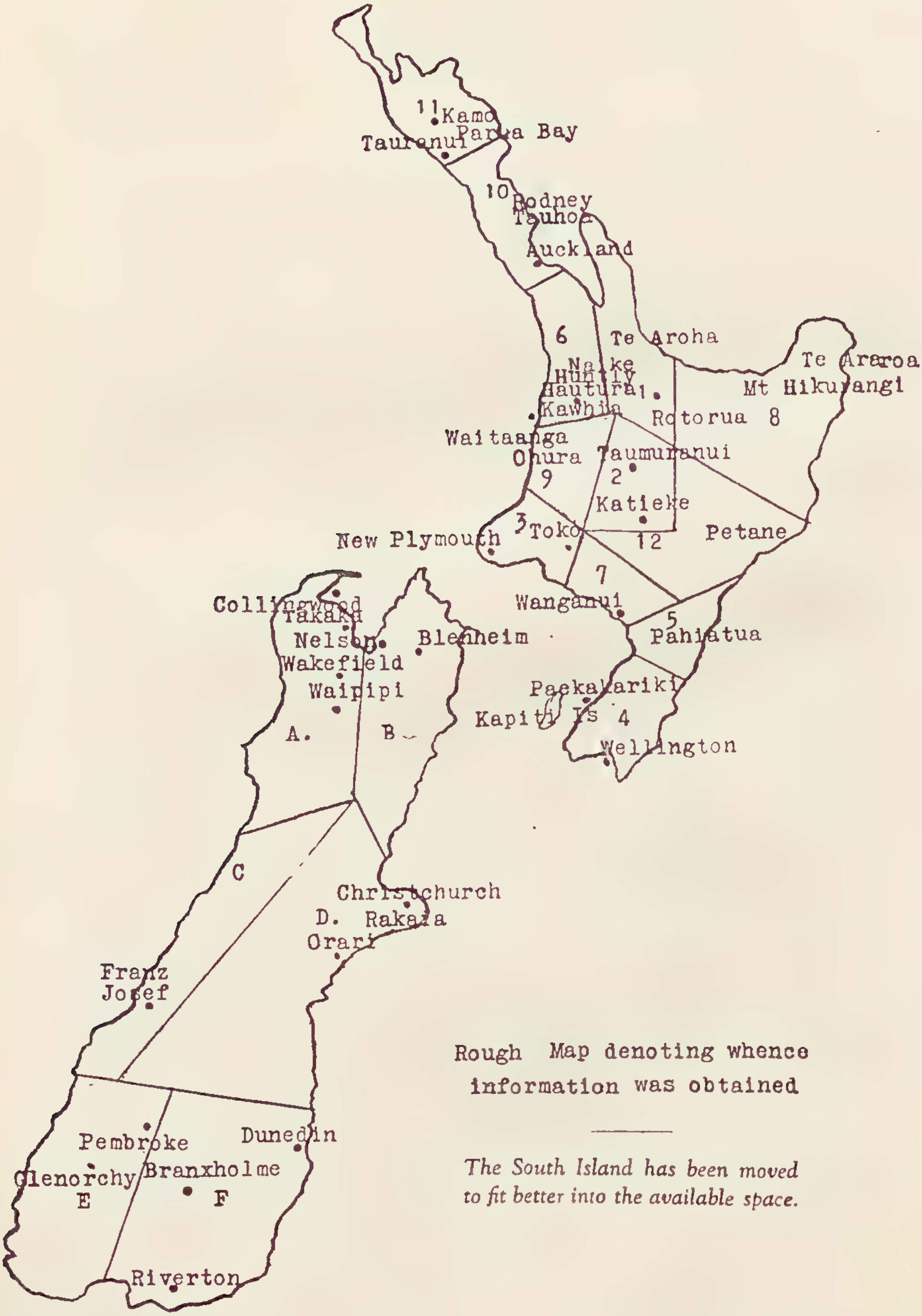
Before studying the question, undoubtedly the majority of people, if asked whether N.Z. birds were migratory, would reply in the negative, yet the reverse is the case.

There is, however, a vast difference between those birds which move a short way, and those like the "Godwit," which go right across the ocean. Under the Section A, of "True Migrants," the writer has placed only those birds which conform to the term "migration" as understood in the dictionary, namely: "Birds which remove from one place to another, especially across the sea."

Under section B are placed those birds which conform to the zoological definition of migration, i.e.: "The transit of a species of animal from one locality or latitude to another."

No bird migrates exactly the same as another. Even though it may occupy the same section as another species, that bird, in all probability, migrates quite differently to its neighbour, though it cannot very well be placed in another group, where the migratory characteristics are even more varied. Take section B of partial migrants with a long range, we see therein such birds as the Dotterel and White-eye, both of which might just as well belong to section A as B, and cannot be compared with such wanderers as Penguins and Petrels, which are only on the land for the breeding season.

There is again a vast difference amongst those residents which are not to be found in the same spot all the year round, and yet cannot be said to migrate far. One has but to compare the regular movements of the Paradise Duck to and from the breeding grounds with the somewhat obscure but periodical movements of the Kingfisher.



Rough Map denoting whence information was obtained

The South Island has been moved to fit better into the available space.

The sections, therefore, are very elastic, and probably when more is known of them some birds will have to be moved into other groups.

Another fact which will come as a surprise, is the extreme regularity of movements amongst migrants; from the regular annual autumnal trek to and from the bush made by such birds as Fantails, to the appearance on the same day from year to year of the Fairy Tern and Pipit, which occurred on the same day two years running in Nelson Province.

It will be noticed that most introduced birds show the same tendency to flock about the country during the autumn and winter months. But in some cases it seems as if by degrees this migratory instinct is lessening (see Redpole and White-eye, which latter was self-introduced from Australia).

Another pleasant fact elicited from these replies to the questionnaire sent out on migration, is the number of species recorded from each area. Unfortunately one or two species appear to have died out since this information has been received, as in area (10), where three species, the Morepork, Woodhen, and one other bird, have become extinct.

Such birds as the White Heron have been recorded, although they are not true residents in the areas from which the data has been received, and should perhaps not be counted in the list of species in that particular area. Against that, we have several birds which have been left out of the list, though undoubtedly present. As, for instance, the Red-billed and Black-backed Gulls, which undoubtedly are present in practically every area by the sea, though often deemed too common to be recorded. Were sea-birds included, undoubtedly they would swell the record of species very much higher.

This list, therefore, is not to be taken as a "complete" record of each area, but will show how each area compares with another in the same species of birds. In area (5) but few birds are recorded; undoubtedly, had there been more observers in this locality, a far bigger number of names would have been forthcoming.

Area E tops the list, as should be expected, seeing that it is the country lying in the vicinity of the West Coast Sounds. Areas 6, 7 and 9 appear, as far as one can tell, to be most deficient in bird life.

In certain cases, the writer has deemed it advisable to suppress the exact locality where certain valuable birds are to be found, The ambition of this paper is not to supply an exact list of where birds are to be found, but to show their migratory habits.

Certain interesting points have arisen when compiling this paper, namely, that 1926 was a most abnormal year in the history of birds. (See Tui, Goldfinch, and White-eye.) Also, that some native birds are altering their breeding and food habits.

In reply to a question about the size of flocks noted in any area came the answer that: Starlings flock up to thousands; Finches rarely more than a few dozen; White-eyes from one dozen to several hundreds; Mynas from six to thirty; and Sparrows up to hundreds.

The writer has occasionally made use of records already published, this is merely to indicate the movement of a certain species, as, for instance, the fact that Mr. Wilkinson has seen but few Oystercatchers on Kapiti Island, proves the fact that they cannot migrate through area (4), or he would have seen them.

Considering the small number of replies received on the whole, to the number of questionnaires sent out, the results obtained have been very satisfactory. It is, however, to be regretted that no assistance was forthcoming from keepers of lighthouses, who might have supplied much valuable data, and often the final evidence required in certain cases.

The writer would like to thank all those who have so very carefully and painstakingly sent observations from each area. These records have been like links, which, when strung together, form a chain of evidence, to prove that birds migrate far more than one would expect in New Zealand.

Without these recorders the writer could never have studied the question of "migration" so thoroughly, and she trusts the contents of this paper may be some small return for the trouble they have taken in answering the questionnaire.

The writer is especially indebted to: Dr. Bathgate, Messrs. A. Simpson, L. Acland, W. Cartwright, P. Baigent, E. Haynes, J. Aspinall, H. Ross, M. Dyer, G. Reid, C. Brown, C. Newick, M. Woollaston, J. Patterson, L. McCaskill, W. Babbage, A. Gudopp, C. F. Cantlay, W. Firth, W. W. Smith, M. O'Donohue, L. Maitland, J. C. McGill Nutt, C. Balthrop, R. M. King, J. Fowler, J. Chaffey, J. Sparrow, R. Stiddolph, T. Cockcroft, T. Shout, M. Rogers, D. Neale, R. Gibbs, F. Hutchingson, H. G. Vine, G. Jacquier, C. Lindsay, C. Calvert, A. Philpott, R. Falla, W. B. Oliver, N. Page, — Snow, C. Flower, the Hon. G. M. Thompson, and the Misses B. Black and H. V. Ross, and Captain E. V. Sanderson.

This paper was delayed for some months whilst the writer sought to fill in the gaps occurring in the information from some areas.

TYPE OF COUNTRY IN AREAS OUTLINED IN NORTH AND SOUTH ISLAND.

(1) This district can be defined as follows:—Draw a line from Rotorua to Katikati and Rotorua to Cambridge, then due north to Miranda on the Firth of Thames, Coromandel, Mercury Bay back to Katikati. Seabirds omitted, except in cases where they come inland to feed (Mr. McCaskill).

(2) Locality due west of Raurimu, rising the first 3 miles to a height of 2240 feet, and then falling in about 6 miles to about 800 feet in altitude, from which portion all observations have been noted. Down the valley flows the Kaitieke River, in a westerly direction, into which tributaries flow from the north and south. The flat portion of the valley and large portions of the hills, which run east and west on each side of the valley, are covered with grass, manuka and bracken. The chief grasses are Brown Top and Danthonia. However, there are considerable portions of the hills clothed with thick Rain Forest, and in the valley there are also smaller patches of Native Bush. The hills rise in their highest points to about 2000 feet, and the valley is almost completely sheltered from the cold southerly winds, except when valleys leading into it stretch towards the south. Snow falls quite frequently on the saddle over which the road passes from Raurimu to Kaitieke in winter and early spring.

Mr. J. Patterson, of area (2), says:—"I may say that I think most of the local migrations in certain districts are simply a quest for food."

(3) Round Toko most of the land is under cultivation, but there is bush further back, from which visits occur of Tuis and other birds. Also birds may live therein, which are not recorded in the paper.

New Plymouth has a large reserve at Mt. Egmont.

(4) Round Wellington the country is more or less devoid of bush, but good bush is found further back.

(6) Observations from Naike occur from that town, situated 12 miles from Huntly as the crow flies in a north-westerly direction, and 11 miles as the crow flies from the west coast, which is due west of Naike.

(10) In sending records of the birds watched in his area, Mr. Falla states: "I consider that there are few, if any, definite and regular migrations undertaken as yet by acclimatised species in New Zealand, in the north at any rate. They are all common in the winter, and all of them breed in the district in fair numbers. Rather do most of them appear to be nomadic, and their mass movements cannot be foretold with certainty. Distribution of food supply is an important factor. A general tendency, however, may be noticed for many species to concentrate in northern districts in the winter.

(A) Chiefly bush country round Nelson, except along coast, but the majority not good feed for birds, being beech forest in most parts, except in the direction of the Government reserve near Collingwood.

(B) Chiefly cultivated country, sheep stations, but some bush on the ranges and on outlying islands, along coast.

(C) Chiefly bush country, except where there are farm lands.

(D) Mostly cultivated. Orari River runs into large lagoon, hence sea-birds records.

(E) Bush country chiefly, but some cultivation. The records from Mt. Aspiring were taken from observations made between sheep station and cattle flat; the next station is 15 miles away.

(F) Chiefly cultivated.

ENDEMIC AND INTRODUCED BIRDS, AS REPORTED FROM THE VARIOUS AREAS MARKED ON THE MAP.

Apteryx australis. North Island Kiwi.—(1) Recorded by Dr. Bathgate and Mr. L. W. McCaskill from the Coromandel Ranges; (3) in Mt. Egmont Reserve; also from Taranaki; (5) present; (6) one in vicinity of Kawhia for years; (7) from 1881 increasing where none seen previously; in 1918 started getting scarce, and in 1922 still fairly plentiful, though not as numerous as in 1911, there being one-tenth the number (Patea and Wanganui River); (10) very scarce; resident; one killed Hoteo Gorge, 1925; (11) in Tauranui reserve.

Apteryx haasti. Great Grey Kiwi.—(a) Present in Government Reserve at Gouland Downs; more plentiful 1926, Aorere River.

Apteryx oweni. Little Grey Kiwi.—(a) Common Quartz Range, 1926 (A. Philpott); seen on Mt. Arthur Tableland (1927), where none had been observed for many years.

Summary.—It seems that *Apteryx australis* is not further south in the North Island than a line drawn from the Wanganui River, and is not plentiful anywhere; in the South Island *Apteryx oweni* is common in certain localities, also *Apteryx haasti;* these birds are more or less resident where found; placed in section C as resident.

Synoicus australis. Australian Brown Quail.—Present in areas (1), (2), (6), (9), and (11).

Callipepla californica. Californian Quail.—(2) Numerous at Taumaranui; (3) present; (4) periodic flock movements like Kingfisher (McGill Nutt); "A few mobs about sanctuary at Kapiti" (Wilkinson); (6) flock together and fly about in all directions; (8) at Te Arawa; (10) rare at Tauhoa, becoming wiped out; resident; not increasing in last three years; (a) plentiful in Nelson Province, but decreasing.

Summary.—Flock together in autumn and winter, but migration fairly local; placed in section D, residents making seasonal movements over an area of 10-20 square miles.

Hemiphaga novæ-seelandiæ. New Zealand Wood Pigeon.—(2) Recorded; (3) present; (4) one visited Wellington, 23rd September, 1924; the Pigeon flies to and from Kapiti Island; (7) no doubt on increase; (8) in Mt. Hikuranga Forest; (9) present; (10) most extensive traveller in list of birds compiled by Mr. R. Falla for Auckland area; making seasonal movements over wide area of 10-20 square miles, its range being nearer 50 miles; (11) in Crown Land Reserve; (a) no longer seen in large numbers, but fairly distributed throughout Nelson Province, wherever sufficient bush; Mr. A. Philpott records it as being fairly common in the Quartz Ranges; occasionally appears on Waimea Plains for a short stay; (b) plentiful in Marlborough Province (Mr. O'Donoghue); (c) fairly common down West Coast; plentiful about the Franz Josef Glacier; (e) about Pembroke mostly in spring time; (f) in vast numbers round Branxholme, 1926.

Food.—The writer noticed a young bird feeding with zest on the young tender leaves of blackberry.

Summary.—Increasing in certain areas, the record from (f) being more like the data given in the early days. Mr. Falla notes that it travels extensively in search of food; it seems migratory within the Dominion. Mr. J. Cody, of Ohakune, instanced a flock which arrived quite exhausted on a vessel off Whakatane; further records should reveal to what extent it moves about. When ringing is practised, such a tame bird as the Pigeon should lend itself to the practice; placed in section D, resident making seasonal movements.

Gallirallus australis. Brown Weka.—(2) Almost disappeared from Taumaranui, though one or two reported; (3) at Mt. Egmont Reserve; (4) plentiful on Kapiti, where breed all the year round; (5) reported from Pahiatua; (7) 1875-6, a limited number; 1900-5, on increase; now quite died out; (10) numerous at Tauhoa; killed off by Weasels at Tauhoa Hoteo; (11) in an area for several years, then move on in the same way as Australian aborigine (Falla).

Gallirallus hectori. South Island Woodhen. — (a) Fairly common Quartz Range, 1926 (A. Philpott); this bird was practically non-existent when the writer came to Nelson in 1921; about 1925 it became common in a few places; down the West Coast, where the writer had previously heard the story, "No Wekas anywhere," they were everywhere coinciding with a plague of mice; since then the West Coast report is: "They were common a year or two ago, and there are still a few, but not so numerous"; (1928) Wekas have almost died out of Nelson again; the same applies to Nelson Province, though in some bush-clad localities they are still fairly common; it is noticeable that their behaviour varies; down the Leslie Valley, behind Mt. Arthur, they were everywhere, but rather wild; they never came into the camp or took anything away; (e) rare, except on West Coast, Milford Sound.

Summary. — The records are not bright, although better than three years ago; Woodhens appear and disappear mysteriously; from the record down the West Coast there seems some connection between their appearance and the mice plague. The writer would here comment on the theory that Weasels are the cause of the diminution of Woodhens, owing to the former stealing the latter's eggs. An interesting letter, written to Mr. A. Philpott, from Branxholme, made it clear that in the West Coast Sounds district the Weka holds its own against the Weasel. It stated that the correspondent could give no reason, but that the Wekas held their own against the Weasel, bringing up their young, though the locality was overrun with vermin. That a nest of a Weasel was examined, to see what feathers it had used for the lining. It proved to contain none but those of the Ground Lark or Pipit (*Anthus novæ-scelandiæ*). There was not one Woodhen's feather in the lining. Placed in section F, erratic migration for unknown cause.

Family Rallidae. Rails.—(1) Landrail common in various isolated districts in Thames valley (*Hypotænidia philippensis?*); (3) Banded Landrail recorded; also the Marsh Rail (*Porzana pusilla*); (7) a Rail recorded, name not given; (10) small Swamphen recorded (*Porzana plumbea ?*); writing on the Rail movement, Mr. R. Falla says: "They inhabit a small area for several years, and then unaccountably disappear, 'irregular migration.'"

Summary.—Unfortunately, most correspondents were not sure of the species, but the writer has included the information, as it shows the distribution of the Rail in the North Island; no records from South Island. Placed in section F, erratic migration for unknown cause. Query whether the ground becomes stale after some years, and they move like hens to fresh pastures.

Porphyrio melanotus. Swamp Hen.—(1), (9), (11) Recorded; (3) at Mt. Egmont; (4) not permanent on Kapiti; (5) rare at Pahiatua; (7) the Pukeko arrived at Patea and Wanganui River, 1903-5, and multiplied enormously; in 1916-17, declined, and now few left; (8) found in swamps at Ruatoria; (10) permanent resident in small swamps, inclined to roam widely in larger swamp areas (Falla); (a) in small numbers in certain localities in the Nelson district; increasing if unmolested; (b) recorded between Blenheim and Picton in Feb., 1926, by Mr. W. B. Alexander; plentiful throughout the year in swamps in Marlborough Province (O'Donoghue); (d) much more common since 1924.

Summary.—Placed in section C, as resident; doubtless this bird moves far more than others, but not as much as the Paradise Duck. It appears to be conforming to modern conditions, and is more or less stationary in small areas of swamp.

Podiceps cristatus. Great-crested Grebe.—(a) On a large lake near Nelson it nests yearly; 1927 it built its nest, but never hatched its brood owing to floods, which, although the bird endeavoured to build its nest up to meet the fast rising waters, eventually swamped the structure; often killed in mistake for a Shag; (c) on most West Coast lakes two to three couples, where not molested; (e) rare at Glenorchy, where one was shot for a Shag; (f) a Grebe shot near Riverton.

Summary.—This bird is, in the South Island, not so rare as thought; its chief enemy is man, who in his ignorance thinks he is killing a Shag. The writer has not traced any migratory movement of these birds to the sea; it appears likely that they move from those lakes which have ice in mid-winter. The only suggestion of such migration is in the record of a bird shot near Riverton, where there are no lakes large enough to be the habitat of Grebe. All birds seen by the writer had crests, even when seen in Feb. (they nest in Nov. to Jan.). This bears out the theory that the New Zealand Grebe has a crest all the year round. Mrs. Johnston states that when near the Franz Josef Glacier she released a Great-crested Grebe from under ice on a river in Aug. Placed in section C, as stationary.

Podiceps rufopectus. Dabchick.—(c) Recorded in the Inangahua county in lakes amongst the mountains; (e) said to be at Glenorchy.

Summary.—The above are the only definite records; though doubtless the bird occurs in the lakes on the West Coast and the Nelson district. Placed as resident in section C.

Eudyptula minor. Little Penguin.—(10) Practically absent from Auckland during the winter; (11) frequent but not regular at Whangarei, absent during 1926; (a) common near Nelson during the breeding season.

Eudyptes pachyrhynchus. Victoria Penguin.—(b) On Aug. 12, 1928, two were brought from Kaikoura, where they were walking inland and launched out to sea, at Nelson, prior to a storm. This drove the birds ashore, one died, the other walked up the main streets. It was fed on oyster beards, fish being unprocurable, and launched out to sea when the weather moderated.

Eudyptes sclateri. Big-crested Penguin.—(8) An additional record to those listed by Mr. Stiddolph in *The Emu* (Vol. XXVI.), sent by Mr. R. Falla, is of a moulting bird found on White Island, Feb., 1927, by Mr. B. Sladden.

Summary.—Not sufficient records to form conclusions about Penguin migration, though they probably migrate regularly. From the statement, that "dead birds of all kinds are found at Orari, East Coast," that coast of the South Island seems more favoured than the West Coast. No record of any of the larger Penguins in Nelson Bay. Placed in section P, partial migrants with large range.

Family Thalassidromidæ. Storm Petrels.—(10) Dead Storm Petrels reported in hundreds in 1920.

Puffinus gavia. Forster's or Fluttering Shearwater.—(8) Recorded at Te Araroa; (a) one came aboard s.s. Arahura, Sept. 24th, 1927.

Puffinus griseus. Sooty Shearwater.—(a) Recorded on Oct. 22nd, 1927, off Stephens' Island; it flew aboard s.s. Arahura; was identified and liberated.

Daption capensis. Spotted Petrel.—(a) Seen in Cook's Straits, Sept. 22nd, 1927; (e) arrives at Mt. Aspiring, Pembroke, with gulls and leaves in April.

Pachyptila spp. Dove Petrels.—(a) Came aboard s.s. Arahura crossing Cook's Straits on May 6th, Dec. 4th, Dec. 11th, Jan. 17th, Jan. 26th, 1927-28.

Pelecanoides urinatrix. Diving Petrel.—(a) Came aboard s.s. Arahura Sept. 21st, 1927.

Summary. These records, though scanty, are of interest; regularity exists in the date that the Spotted Petrel returns to Pembroke. The records of Dove Petrels are from Mr. Balthrop, Chief Engineer, s.s. Arahura, running between Nelson and Wellington. Whenever a bird came aboard, it was reported. The rush to the breeding grounds is shown by the records of one week:—Sept. 21st, Diving Petrel; Sept. 22nd, Spotted Petrel; Sept. 24th, Forster's Shearwater, the latter birds brought ashore for identification. If all coastal boats had keen observers like Mr. Balthrop, we should know more about ocean birds than at present. Placed in section B, partial migrants with large range.

Phalacrocorax carbo. Black Shag.—(1), (7) Present; (2) a few at Taumaranui; (4) breeds on Kapiti, travels to mainland for fishing; (6) present on coast; (10) makes seasonal movements 10-20 square miles; (11) always present Parua Bay; (d) come and go at irregular intervals at Orari.

Summary.—Placed in section D, residents making seasonal movements over not extended area; they are more numerous in the autumn months in Nelson Bay, following the movements of fish. Once, when a shoal entered the harbour, over a hundred shags were on Arrow Rock, where usually there are from a dozen to twenty.

Phalacrocorax varius. Pied Shag.—(1) Present; (4) occasionally noticed amongst other shags on Kapiti; (8) on coast, Te Araroa; (10) always present (Falla); (a) number increases in autumn. In Nelson Bay two Pied Shags were on Arrow Rock, Feb. 28th, ten on Mar. 9th, twenty-five, April 15th, 1926.

Summary.—As they increase and decrease in Nelson Bay, and are noticed only occasionally amongst other Shags on Kapiti Island, it appears that they move about. Placed in section D.

Sula serrator. Gannet.—(10) Absent in winter except for a few birds (Mr. R. Falla, Auckland); (12) breed in large numbers at Cape Kidnappers; (a) appears when there is unsettled weather in the Straits; several times in Nelson Harbour, both in autumn and winter; at Stewart Island an occasional visitor during unsettled weather; (4) common, Wellington Harbour.

Summary.—Very few records sent of this conspicuous bird. Placed in section B, partial migrant with large range, as it undoubtedly moves about considerably after fish. Few immature birds seen away from the gannetry, most birds observed fishing in adult plumage. As they are absent from Auckland and most commonly seen in Nelson Bay during that period, Gannets appear to go south during the winter months.

Chlidonias albistriata. Black-fronted Tern.—(a) Seen near Mt. Cook, nesting amongst pebbles on shore of a lake (November).

Hydroprogne caspia. Caspian Tern.—(4) Present in Wellington during winter; (10) moves over area of 10-20 square miles; (a) present autumn, winter, and early spring; recorded April 4th, May 29th, June 19th, and as late as Nov. 10th, 1927; not during summer months.

Sterna striata. White-fronted Tern.—(10) Absent from Auckland during winter; (d) called "Sea Martin," appears in winter when ploughing at Hororata (L. Acland); (e) Terns arrive Aug. 15th at

Mt. Aspiring, Pembroke, the same as Dotterels, in pairs (J. Aspinall). Query, which kind? Presumably the above as the commonest Tern in New Zealand.

Sterna nereis. Fairy Tern.—(a) Only seen two years running on March 8th by Capt. M. Moncrieff, therefore must be migratory.

Summary.—Terns are more or less nomadic; Caspian Tern appears to wander down the West Coast of New Zealand during winter, whilst White-fronted Tern similarly leaves Auckland and is found in winter at Hororata in area C or on West Coast; regular in returning to its breeding haunts, arriving to the day on Aug. 15th at Mt. Aspiring in area E; regularity also in movements of Fairy Tern as above. Placed in section B, partial migrants.

Larus dominicanus. Black-backed Gull.—(3) At Toko appear mostly in spring time, flying S.E., seldom more than two or three at a time; (4) present in Wellington Harbour in numbers; (7) a visitor; (8) common on coast and inland at Pakihiroa; (11) always present in numbers, Parua Bay; (a) common in Nelson Harbour, and far inland; no signs of migration except to breeding grounds; on Dec. 31st a Gull rested on a tree at Wakefield, for the first time in fifty years (Mr. Percy Baigent); (c) seen up mountain gorges, where cause great uneasiness to Paradise Duck with young; (d) in thousands at Orari River and gorge of Rangitata River; also at Hororata; (e) with Mackerel Gull arrive about same time as Cape Pigeon; leave April in flocks from Mt. Aspiring, Pembroke.

Food.—Secures crickets in autumn from paddocks in Parua Bay; seen for the first time so doing by Mr. F. A. Locke, though he had lived for three years in the same area and not observed it before.

Summary.—A common bird, apparently changing some of its habits. Placed under section D, making seasonal movements over an area of 10-20 miles, though doubtless they go further afield at times. The record from (E) shows that it moves regularly to and from breeding area, which is far inland.

Larus novæ-hollandiæ. Red-billed or Silver Gull.—Recorded in areas 1, 3, 4, 8 (on coast) and 11 of North Island, and a, b, c, d, e and f of South Island.

Food.—According to Mr. F. Locke eat crickets in autumn; during winter fly in huge flocks, obscuring the sun, from Thames Hills to Hauraki Plains to feed; grass paddocks being white with birds; at sunset they return.

Summary.—This bird is so common that few people mentioned it. Like the Black-backed Gull, it may change its diet and is regular in its breeding as recorded from (e), where it nests at Mt. Aspiring, arriving at the end of Sept. and leaving in April. Placed in section D, residents making seasonal movements.

Hæmatopus ostralegus. Oystercatcher.—(4) Two were visitors on Kapiti Island; (10) summer visitors; (a) seen Oct. 13th, 1927, on Cape Farewell Spit; in couples; the Pied and Black were together; one pair consisted of a Pied and a Black (see Vol. XVIV., Part I); Feb. 22nd hundreds on the beach at Tahuna, near Nelson; all were Pied; with Godwits they appeared March 4th and left March 8th; on March 10th a few stragglers (corroborated 1928); further records March 26th and June 30th, 1927; (c) numbers down West Coast during summer; (f) recorded from Riverton.

Hæmatopus unicolor. Black Oystercatcher.—(10) Moves over an area of 10-20 square miles (Falla); (11) nesting (Dr. J. Myers, 1924); (a) small numbers on Cape Farewell Spit, Oct. 13th, 1927; (e) arrive at Pembroke Sept. 29th; (f) recorded from Riverton.

Summary.—Black and Pied Oystercatchers found together in certain areas, but do not keep together. The Oystercatcher is much less common on Stewart Island. Hundreds of birds assembled on Tahuna Beach, near Nelson, with Godwits; all were Pied. They spent a few days there, and then trailed across the sea, in long lines, going right out, not inclining towards Cape Farewell Spit. Where were these birds going? If to the North Island, they must have been going right up north, because Mr. Wilkinson on Kapiti Island saw no Oystercatchers there, and such a number of birds would hardly escape notice by one interested in birds. Therefore they were either going to the very north of North Island, or migrating away with the Godwits. Whither had they come? One would think from further south and not from Cape Farewell Spit, for had they wanted to migrate from thence they would do so without coming into Nelson Bay. The writer suggests that they migrate to Australia and Tasmania, and that the southern-most birds of N.Z. work their way up to the north of the South Island (note records March 26th and June 30th). The writer has seen birds down the West Coast at Okarito, near the Franz Josef Glacier, which may easily fly north on their way from N.Z.; also birds recorded as summer visitors at Glenorchy may congregate in the north of the South Island. The record from (e), that Black Oystercatchers arrive at Pembroke Sept. 29th, suggests that the Black and Pied do not keep together when migrating; corroborated by the fact that none but Pied Oystercatchers were with Godwits on Tahuna Beach at (a). From (10), recorded that Black Oystercatchers move over an area of 10-20 square miles (Falla); it appears likely that the Black Oystercatcher is not such a migrant as the pied bird. Placed in A, true migrants, for, although their destination may be problematical, there is no doubt that they assemble in large flocks and move away regularly every year, returning to the same spot the following year.

Charadrius bicinctus. Double-banded Dotterel.—(1) On Oct. 16th, 1926, at Lake Rotorua, with young just hatched on a strip of beach formed by an inlet of the lake; (8) present at Tuhawa and Ruatoria; (10) more numerous in the summer (Falla); (a) at Takaka at end of Sept.; on Tahuna Beach, March 26th, 1927; they do much good on the golf links during autumn and winter; 1927, Mr. King, of Golden Downs near Nelson, records: "Dotterels came back during the first week in September." During spring and summer, Dotterels go to high country and dry river beds to nest. The writer records them with young just hatched in the vicinity of Arthur's Pass, the first half of December (c) and in the river-beds on the Nelson Plains after they have left the golf links and sea shore. (d) Frequent visitor to Hororata; on Rakaia River noted from March to Nov. 1st; (e) summer visitor; arrive Aug. 15th, in pairs, other later (Mr. J. Aspinall, Mt. Aspiring, Pembroke).

Summary.—Place in section B, partial migrants with large range. In Hutton & Drummond's "Animals of New Zealand" it is stated: "The Banded Dotterel has been suspected of migrating from New Zealand to Tasmania in the autumn, as it is common in Tasmania during the winter, and is equally abundant in the South Island all the year round, showing no signs of migrating, and as Mr. Handley reports that it is also common in Marlborough through the year, it may safely be affirmed that it does not pass regularly to and fro between Tasmania and New Zealand." Here is an ideal example of lack of knowledge which must exist until ringing of birds takes place. The writer suggests that the south-westerly Dotterels in area (e) migrate to Tasmania and that there is the same trend to move northward for food and warmth which is shown by other birds. In both (a) and (d) Dotterels recorded in March. About the time Godwits and Oystercatchers are congregating on the beach at Nelson, many Dotterels are seeking food amongst the rocks and pools. Presumably some pass on, whilst others spend the winter about the golf links. There may be two movements as suggested, (1) the most southerly birds to Tasmania, (2) the others working their way northward. If this is the case, the former birds take the shortest route to Tasmania, the presence of Banded Dotterel being recorded on Feb. 13th in the July number of *The Emu*, 1927.

(To be Continued)

Observations of "Jacky Winter"

By Mrs. PEARL HANKS, Coburg, Melbourne.

Communicated by C. BRYANT, R.A.O.U., Melbourne.

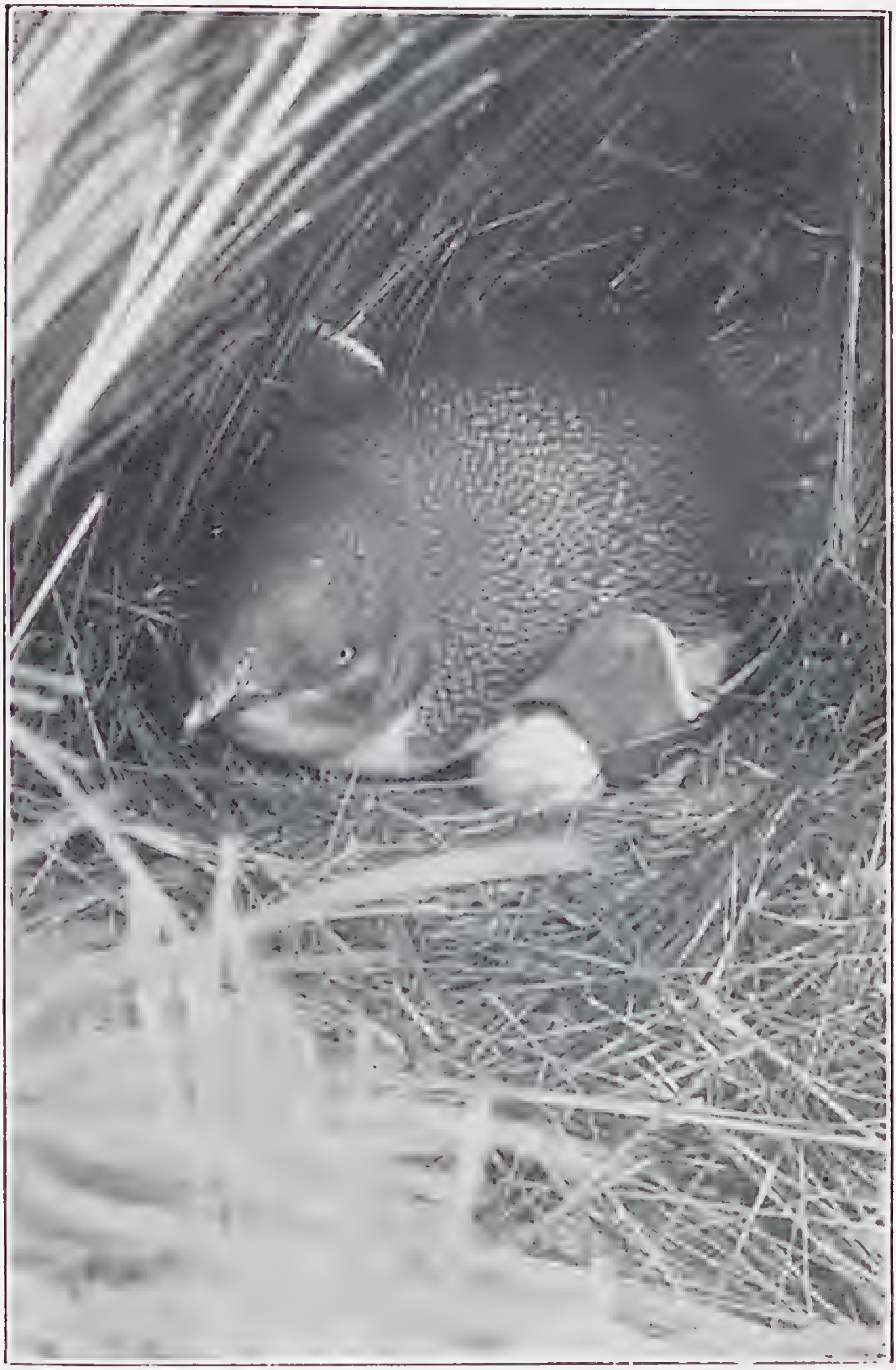
A general favourite is the Australian Brown Flycatcher *(Micrœca fascinans)*, more familiarly called "Jacky Winter." The jaunty name seems to suit the bird. He loves to sit on a post or stump, and to swing his tail to and fro sideways, darting out every now and again to catch the insects which form his diet. His size, 5.2 inches, is the same as several of our Robins, and his colour a plain brownish-grey above, and lighter underneath, with the outer tail feathers white—often causes those who do not know him to mistake him for a Hen-Robin. Unlike the Robins, he is not migratory, and may be seen in the one district for years, all the year round. He seems to prefer cleared or lightly timbered country. I have made my observations of him, mainly at Wandin, and also at Panton Hill, where several frequented an orchard. The nest is usually recorded as being built at a considerable height.

At Wandin, early one November, we were fortunate in finding a nest at about five feet from the ground, in a small eucalypt which had very few leaves. The nest was a tiny frail saucer of grass, 2½ inches across and less than 1 inch deep; it contained 2 bluish-green eggs.

We spent several hours watching the pair. The male frequently brought food to the sitting hen. We were much amused at her behaviour. As soon as the male was out of sight, she would leave the nest and sit on a nearby branch preening herself. She would return to the eggs and settle herself just before he returned with the next mouthful of insects, which she would accept with great fussing and fluttering. This was repeated many times while we watched. We were forced to suspect that she was obtaining maintenance under false pretences. As the weather was warm, the eggs evidently came to no harm. On our next visit a fortnight later the nest was deserted, and we caught a glimpse of the parents feeding young birds in high branches not far from the nesting site.

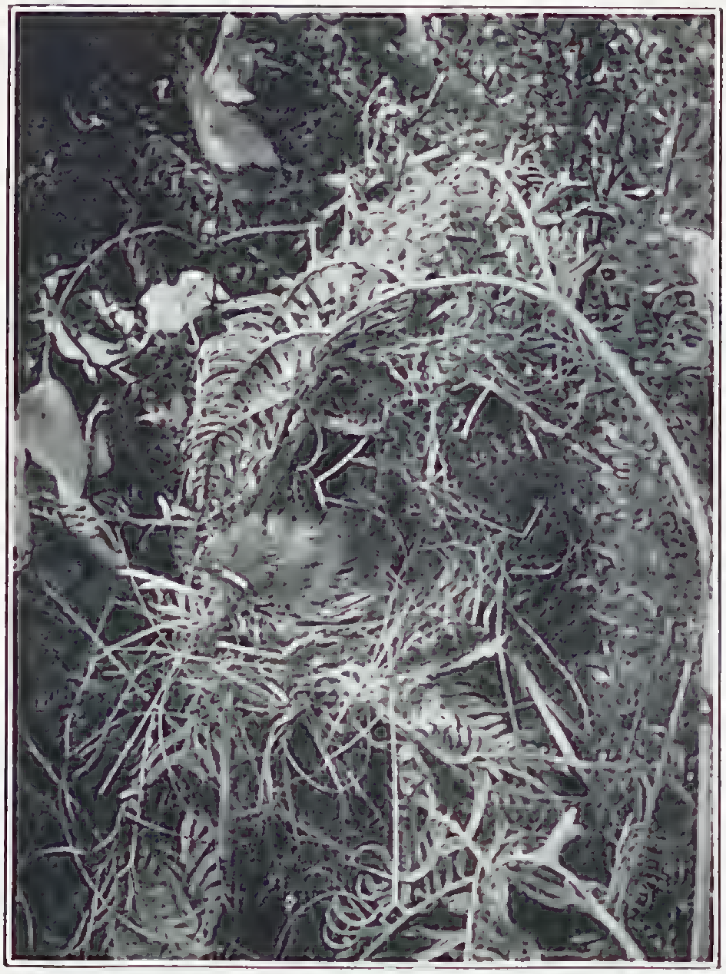
The male, like his relative, the "Willie Wagtail," is a courageous little fellow in defence of his home. While we watched he drove away any bird which came within several chains of the nest. A Sacred Kingfisher *(Halcyon sanctus)* was quickly put to flight; but a pair of Fan-tailed Cuckoos *(Cacomantis flabellifera)* gave him much trouble. They were probably mating, and flew wildly here and there through the trees uttering discordant cries. Jacky attacked vigorously whenever they intruded on his domain, and finally they flew to other parts.

A cheerful little friend to man, our enjoyment as he brightly calls "Peter Peter," is unalloyed, as his diet of insects is all in the orchardists' favour.

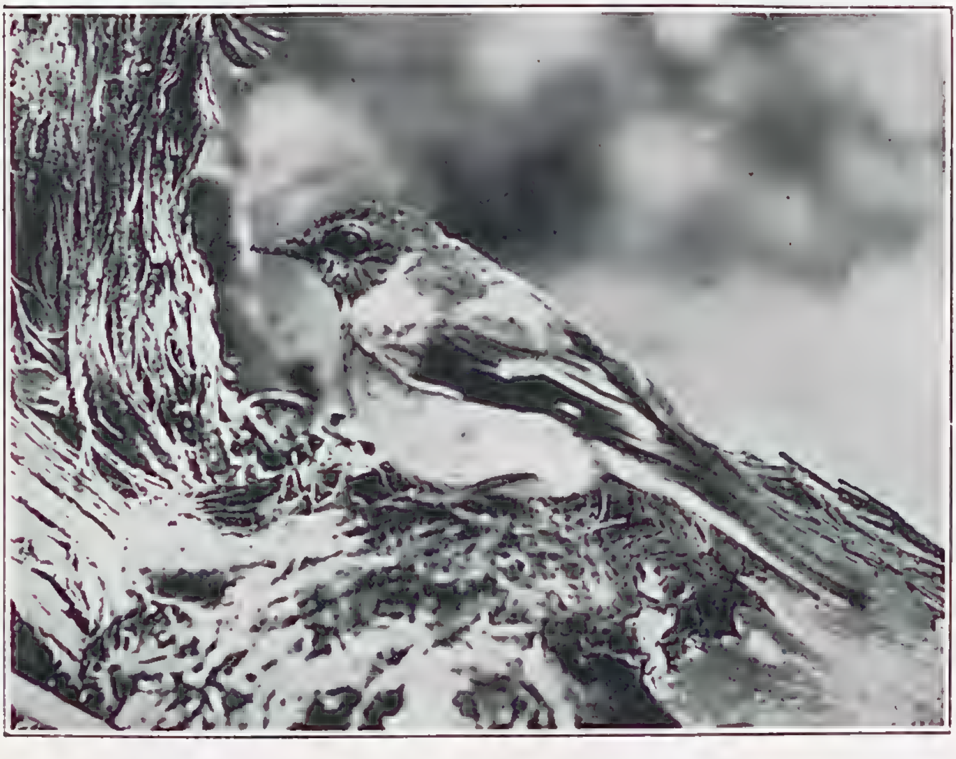


Little Penguin *(Eudyptula minor)* on nest at The Nobbies, Phillip Island, Victoria.

Photo by D. Dickison, Hon. Gen. Sec., R.A.O.U.



Young Horsfield Bronze Cuckoo, in nest of Superb Blue Wren.
Photo by D. Dickison, R.A.O.U.



Hooded Robin, in immature plumage, at nest.
Photo by Alex. D. Selby, R.A.O.U.

Camera Craft

Little Penguins on Phillip Island.—One of the interesting features of Phillip Island is the small rookery of Little Penguins *(Eudyptula minor)* along Shelly Beach, at the Nobbies. The birds nest there freely during November and December in each year, usually selecting a shallow burrow or the space under a drooping bush of marram grass, in which to lay their two dirty white eggs. When I visited the rookery early in December, 1925, I found the birds were in various stages of breeding. Some were still sitting on eggs, while in other instances fully feathered young were concealing themselves under the bushes. I have been informed by the Chief Inspector of Fisheries and Game (Mr. F. Lewis) that the rookery is being rapidly depleted by foxes, which make destructive raids upon the birds. Although efforts are being made to exterminate the foxes on the island, it is feared that the Penguins will be unable to maintain their existence in any numbers much longer. — D. Dickison, Hon. Gen. Sec., R.A.O.U.

* * *

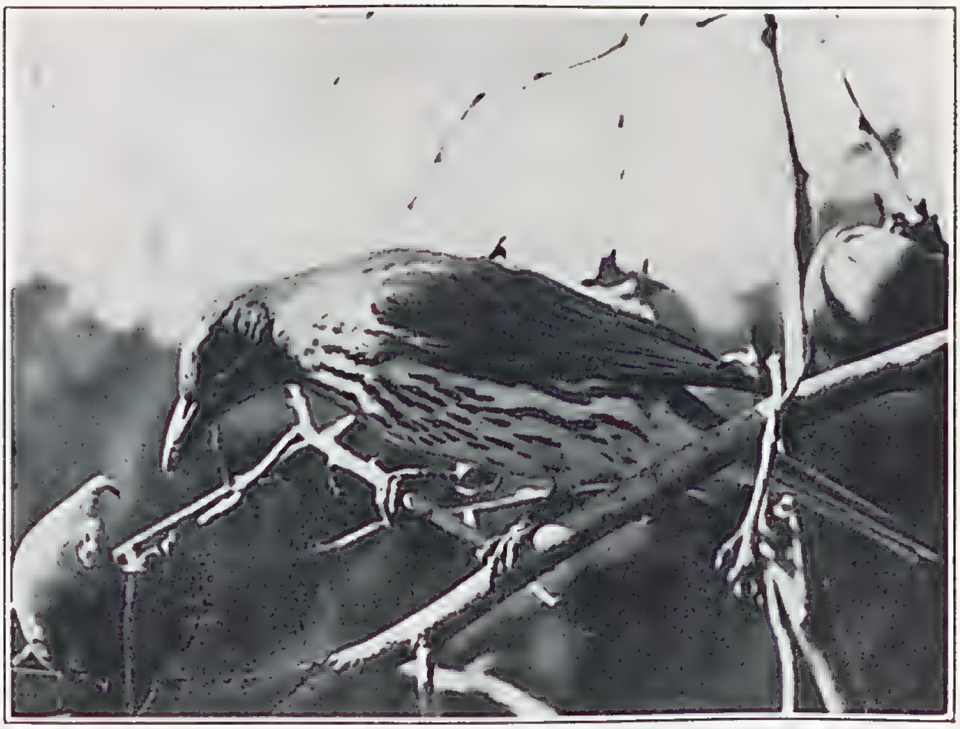
Horsfield Bronze Cuckoo and Blue Wren.—When a nest of a Superb Blue Wren *(Malurus cyaneus)* was found near Lilydale in November, 1925, there were four partly incubated eggs in it, but a fortnight later one young bird had been hatched and the other eggs were missing. The fledgling eventually proved to be a Horsfield or Narrow-billed Bronze-Cuckoo *(Chalcites basalis)*. It had apparently ejected the young Wrens from the nest as soon as they were hatched, though no trace of them could be found on the ground beneath the nest. The voracity of the Cuckoo kept its foster parents constantly engaged in supplying it with food. A week later the young Cuckoo was almost fully feathered, and had developed so rapidly that it had burst the entrance of the nest to twice its natural size.—D. Dickison, R.A.O.U., Melbourne.

* * *

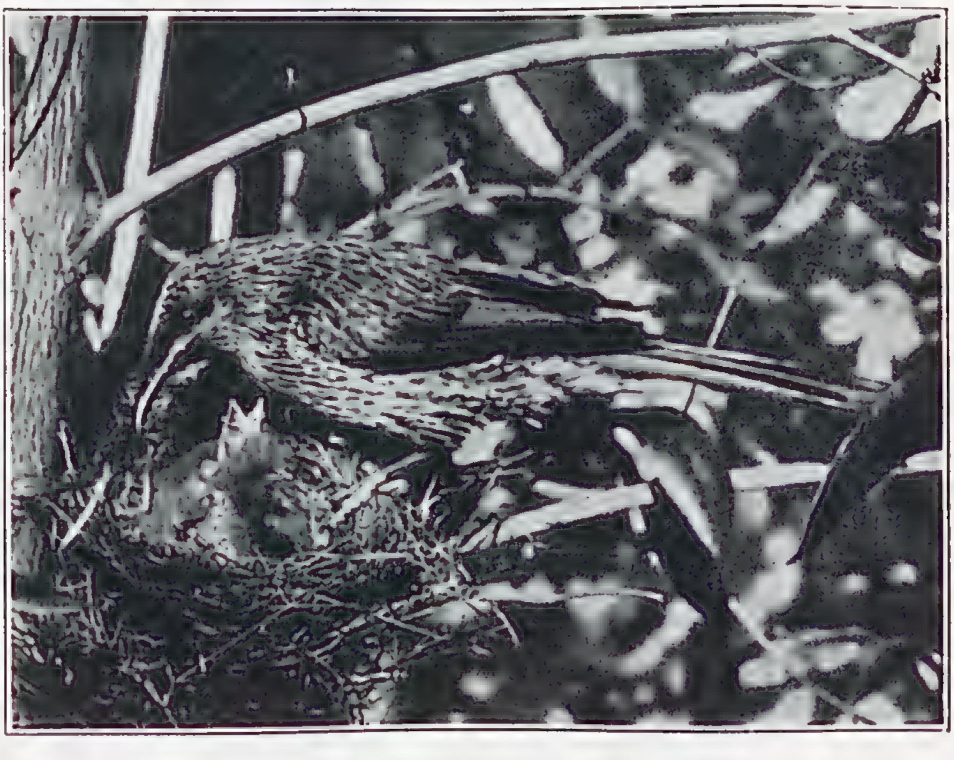
The Nesting of Hooded Robins.—Having spent much time in observing the nesting habits of Hooded Robins *(Melanodryas cucullata)*, I was beginning to feel sure that the male bird took no part in the incubation of eggs or feeding the young. While photographing the female, however, I was pleasantly surprised to see a male arrive and feed the young while the female was absent. I snapped him, but was disappointed to find that the negative was a mere blur, though the exposure was only 1-60 sec. The following week I tried again, and succeeded in getting a fair picture, in spite of harsh lighting effects. It will be noted that this particular male is not in mature plumage, the deep black of the full-fledged male being shown only as a darker grey. He was very busy, and made many trips to the nest while I was watching, though he knew I was there; in fact, I was not more than eight feet away when I released the shutter by means of a thread. The camera was 20 inches from the bird. The hen Robin was remarkably tame, and apparently indifferent to the presence of the camera, but the male was rather shy. The nest was low down in a grape vine. Since then I have startled a male from another nest, but this nest also had young birds in it, so now I am of opinion that the males sometimes feed the young. This second male was in full plumage, but I have never seen a male go to the nest when the hen is sitting. Perhaps other members have.—ALEX. D. SELBY, R.A.O.U., Quantong P.O., Vic.

* * *

The Little Wattle-Bird.—During the spring months the Little Wattle-Bird *(Anthochæra chrysoptera)* is much in evidence among the gardens of the North Shore suburbs of Sydney. Many inquiries are made by local residents regarding the bird that makes "that awful noise," and it is not surprising that its persistent raucous squawks have made it more familiar than the many other denizens of our flowering shrubs. Mr. H. Wolstenholme has given an account of the nesting habits of a pair which reared their young in his garden at Wahroonga (*Emu*, XXVI., pp. 302-304). During September, a pair is often to be seen feeding on a clump of waratahs at my home. I had several attempts to photograph them in this situation, but in spite of my patience they always kept away from the particular flower on which my camera was focussed. At the time of writing, May, a pair came down every day to ripe persimmons in the garden. The large Red Wattle-Bird *(Anthochæra carunculata)* is also there, but never in company with the former; and, whereas the large fellows usually denote their presence by their familiar cries, the others are comparatively silent at present. Here, again, I have tried my luck with the camera, but the same result with the waratahs has so far held true for the persimmons. In October, 1926, I spent a day at the nest in Mr. Wolstenholme's garden, mentioned above, but while I was there the parent birds visited the nest only twice, and then in bad positions for photography. In September, the following year, I found a nest far more conveniently placed than the former. It was situated about nine feet up in a slim sapling, near a frequented path. The clumsy structure was placed at the junction of a horizontal twig, and owing to the wind that was then blowing, I was doubtful if the birds would get their nestlings safely away. The nest, when found, contained a young bird and an egg, which hatched soon after. One afternoon a few days later I obtained a few pictures of the bird at this nest. The tree was tied firmly on account of a stiff breeze, and some of the near-by saplings were bent aside to expose the nest to the sun. The bird came readily, and when settled, had to be touched with a stick to be disturbed, although once or twice she stayed away



The Olive-backed Oriole eating a Pomegranate.



The Little Wattle-Bird at Nest.

Photos by H. C. Barry, R.A.O.U.

for a considerable time. Several other bird photographers visited the nest later, but with disappointing results. Perhaps the bird was aware of the frailness of her tree, and the wind blowing at first had the desirable effect of bringing her more readily to her home. — H. C. Barry. R.A.O.U., Wahroonga, New South Wales.

Stray Feathers

Early Nesting of Birds in North-eastern Victoria.—The present early season has had a marked effect on the nesting of many birds. During the early part of May, I was surprised to observe in the Chiltern district, Eastern Rosella Parrots *(Platycercus eximius)* preparing nesting hollows in fence posts —a favourite site, since the available natural hollows have been polluted by Starlings. On 8th May, a pair of Eastern Shrike-Tits *(Falcunculus frontatus)* had a nest almost ready for eggs. Several nests of birds of prey, probably Whistling Eagles *(Haliastur sphenurus)*, which were examined, contained fresh green eucalyptus leaves, indicating that the nests were soon to be occupied. Bird life was prolific in the district, a list of seventy species being made during a fortnight's observation. Twenty-four species were noted in an afternoon outing with the scholars of Cornishtown State School.—N. A. R. Arnold, R.A.O.U., Melbourne.

Migrants to Northern Tasmania in 1928.—Although the Welcome Swallows, Wood-Swallows and most of the Pipits left at the end of March (there was a spell of rain and cold during the first week of April), yet one pair of Welcome Swallows *(Hirundo neoxena)* remained about the streets right through the winter, and seemed to pick up a good living. The same species was also noted in Launceston. In Hobart one individual was seen on a building at the corner of two principal streets on 3rd July, so that a few pairs evidently winter with us throughout the island, and not only in the comparatively mild north-west. A Fan-tailed Cuckoo *(Cacomantis flabelliformis)* was heard in a Launceston garden at the end of June, and on 7th July, a warm, spring-like morning, one was sitting on my garden fence, uttering the double-whistle, which is the representative of the "Cuckoo" note of the British bird. This individual had a bright rufous throat and breast, much more so than the usual run of these birds. On 6th May, several Pipits *(Anthus australis)* appeared, feeding in a cultivated paddock, and on 25th June three more were seen in a rough grass paddock. On 28th July, a Fan-tailed Cuckoo was calling with the soft trill, as distinguished from the double-whistle previously heard. No Spine-tailed Swifts *(Hirundapus caudacuta)* were seen last summer (Dec., 1927, to April, 1928) by myself, although a friend told me that on 14th March he saw a small party pass over Devonport at 6.30 p.m., flying fast, and heading north-west, as if migrating. A pair of Summer-Birds *(Coracina novæ-hollandiæ)* wintered with us, frequenting a large garden, which is sheltered by Sequoias and other conifers. Last month (July) I noticed one of these beautifully-plumaged birds fly to the foot of a paling fence, pick something (probably a caterpillar) from the grass there, and fly to a fence across the road to dispose of the captive.—H. Stuart Dove, F.Z.S., W. Devonport, Tas., 10th August, 1928.

A Nestling Kookaburra.—After a severe storm we picked up a nestling on a remote country road beyond Orbost. Kookaburras *(Dacelo gigas)* were flying overhead, and from the noise they made we knew it was a young Kookaburra. The adult birds followed us for about two miles. Arriving at our destination, we fed the young bird with worms. At the end of four days he had learnt to swallow. In the daytime we kept the nestling in a wire-netted enclosure. Adult Kookaburras found him there, made a great deal of noise, then commenced to bring him food, consisting of frogs and beetles. The young one kept up a constant whine. It was interesting to see the colour come in to the wings and the brown deepen on the bird's head. The Willie Wagtails *(Rhipidura leucophrys)* used to fly into the enclosure and attack him, so when he seemed fully grown we set him free, and eventually he went away with a mate.—Miss E. C. Cameron, Melbourne.

The Hovering Trait of the Tawny Frogmouth.—One evening towards the end of May I was on the cottage verandah just as dusk was falling, when a Tawny Frogmouth *(Podargus strigoides)* flew to a paling fence near by. After sitting there a little, he flew diagonally upwards to near the top of a Cape Wattle, which grew near the fence, and, hovering in front of a twig, picked off an insect and returned with it to his former perch. In a couple of minutes or so, he repeated the performance, hovering in front of a twig near the first one, and returning to the fence to dispose of his capture, after which he flew away towards a clump of Silver Wattle. The action reminded one of a Spinebill Honeyeater *(Acanthorhynchus tenuirostris)* hovering in front of fuchsia flowers, but was not so prolonged.—H. Stuart Dove, F.Z.S., W. Devonport, Tas., 9/6/28.

The Yellow-Tailed Black Cockatoos *(Calyptorhynchus funereus)* seems to have developed a new habit, or discovered a new source of food supply. Last summer the Monterey Pines *(Pinus insignis)* throughout the forest were visited, and the green seed cones were crushed and stripped, either for the seed or some wood-borer's larvæ that had attacked the cones.*—G. Graham, R.A.O.U., Scott's Creek.

*Probably the latter. On the Bunya Mountains, at the R.A.O.U. camp-out in 1919, Crimson Rosellas *(Platycercus elegans)* were discovered by Captain S. A. White to be removing insect larvæ from the developing cones of the Bunya pines.—[Eds.].

The Australian Ground-Thrush.— A very pleasing and hitherto-unrecorded visitor to our home shrubberies was identified this morning in the form of a fine specimen of the Australian Ground-Thrush *(Oreocincla lunulata)*, which was observed sitting with its characteristic immobility on a bough well inside the shelter of a large laurel bush, not 15 yards from the front door. Some weeks ago, Mrs. Legge, who, like myself, is a great lover of all the feathered tribe, mentioned to me that she had noticed a large strange bird in the grounds around the house, but, as it had taken flight immediately it became aware of her approach, she was unable to give me anything like an adequate description, and beyond a mere speculation, I gave no further thought to the matter. Yesterday afternoon, however, Mrs. Legge had a full and close view of this beautiful bird, which was standing upon a fallen pine-cone. Whilst she kept still, so did the bird, and during the close scrutiny it received, from a distance of about 20ft., Mrs. Legge was able to memorise its markings, bill, and especially the round full eye, so that she gave me a good description, which left no doubt at all in my mind as to the identity of the bird. Accordingly, this morning after breakfast, we sallied out to search. I was shown the spot where the bird was seen, and proceeding to what I took to be a likely shelter, a very wide-spread laurel, I first noticed the familiar splashy droppings on an old dead bough on the ground, and in the next half-minute, I espied my friend sitting up in the bush as described above, keeping perfectly still, and in no way shy of Mrs. Legge's approach, when I called her to look at him. How this bird ever made its way into the haven of our homestead I cannot understand, for Cullenswood is surrounded by open pasture lands and sparsely timbered rises and flats of tussock, the nearest thickets likely to harbour a bird of this species being quite 1¾ to 2 miles distant to the south, and the same distance to Mt. Nicholas gullies on the north. The only theory I can offer is that during a terrible north-east monsoonal storm, with over 6in. of rain, and a full gale of wind behind it, which we experienced in this valley during July, the bird may have been driven out of its secluded haunts in the foot-hills of Mt. Nicholas. As the summer brings its dry time, I expect this lovely visitor will depart, if it does not fall a prey to a domestic cat beforehand. — Robt. W. Legge, R.A.O.U., Cullenswood House, Cullenswood (Break O'Day R.), Tas.

Bird Notes from Southern Tasmania.—Numbers of the Spine-tailed Swift *(Hirundapus caudacutus)* passed over, travelling to the north-west (24/2/28). On 14/4/28, a nest of the Australian Ground-Thrush *(Oreocincla lunulata)*, built in the top of a tree fern, was found, containing two young birds, which were partly feathered. It is a puzzle to decide whether this is an early or a late record in nesting. A Superb Blue Wren *(Malurus cyaneus)* was sitting on a nest containing three eggs. This nest was found when a patch of scrub was being cleared.

It was built in a clump of starfern, growing by a tussock. Though the spot was left untouched, the bird was afraid to return (16/2/28). The pair of these Wrens which frequented my garden reared three clutches last season. They brought their young ones to the doorstep in search of bread crumbs. They readily ate these when they are crumbled very small. A pair of Crescent Honeyeaters *(Phylidonyris pyrrhoptera)* built their nest and reared their young in a low Pelargonium bush growing in the garden. The nest was only a foot away from a path that was constantly used (September-October, 1927). Another interesting nesting site, but this time of the Yellow-winged Honeyeater *(Meliornis novæ-hollandiæ)*, was between the spreading leaves of a large cabbage. The nest was not found until the young were almost ready to leave. When I asked about making a photograph of this extraordinary situation for a nest, I found that the cabbage had been cut for the table, and the part containing the nest had been cast away. For the first time in three years the Red-capped Dotterel *(Charadrius ruficapillus)* nested on this beach, hatching its young safely (February, 1928). I have discovered here a haunt of the Lewin Water-rail *(Rallus pectoralis)*. Owing to the illness of my sister during the last six months of 1927, in consequence of which I took charge of her school, I was unable to study the locality and ascertain if any differences occurred between this southern range of the bird compared with its family life, as I knew it in its north-eastern habitat. On 20/3/28, I found a large Albatross dead on the beach. We had had a rough sea for several days. The bird was very large, and quite white, with the exception of some of the wing feathers. Its colouring appeared to agree with the description of the Snowy Albatross *(Diomedea chionoptera)*, as described in Lord and Scott's book, *The Vertebrate Animals of Tasmania.* I informed Mr. Clive Lord by telephone of my belief in the identity of the bird. He expressed a wish to see it, so I sent the Albatross to the Museum. Mr. Lord recorded this in the last issue of *The Emu.* A bird resembling the Blue Petrel *(Halobæna cærulea)* was also brought ashore during the storm, but it was in a very damaged condition. — MISS J. A. FLETCHER, R.A.O.U., "Lyeltya," Eaglehawk Neck, Tas.

Obituaries

WILLIAM LEON DAWSON.

A letter has been received from Mrs. Frances E. Dawson announcing the death of her late husband, William Leon Dawson, in Columbus, Ohio, U.S.A., on 30th April, 1928. He was 55 years of age, and was in good health a week before his death, which was due to pneumonia. He had been a prominent member of the American Ornithologists' Union, and a member of the Royal Australasian Ornithologists' Union, and his fame as an ornithologist and oologist was world-wide. In 1902-3 a work by him, *The Birds of Ohio,* was published. In 1909, in association with J. H. Bowles, he produced the *Birds of Washington,* and five years ago his magnificent and beautifully illustrated book, *The Birds of California,* in four volumes, was circulated. He had gathered much material in the way of field notes and photographs for proposed publications on the birds of Florida, the birds of Mexico, and a second edition of the birds of Ohio.

While the ornithological world will regret his untimely death, it will also extend its sympathy to Mrs. Dawson, who for many years had rendered him great assistance in the preparation of his works.

LEVERETT MILLS LOOMIS.

Leverett Mills Loomis, well known American ornithologist, died at San Francisco on January 12, 1928, aged seventy years. He is best known to Antipodean ornithologists through his publications on the Petrels, in which Antarctic species are discussed. His Monograph of the Petrels was not quite completed at his death, but the finishing touches are now being given it by Mrs. M. E. McLellan Davidson, his colleague in the California Academy of Sciences.

Science suffers a severe loss in Mr. Loomis's death, for he was a most careful, indefatigable and fearless seeker of the truth. His scorn of poor work, and his failure to fall in line with the current vogue for geographic sub-species, however, narrowed the circle of ornithologists who kept in close touch with him. His attitude as to sub-species was not that they did not exist, but that their position as incipient species was unproven. The latest findings as to the mechanism of species origin show how sound his attitude was in this respect.

Mr. Loomis was curator of the Department of Ornithology of the California Academy of Sciences from 1894 to 1912, and Director of the Museum from 1902 to 1912.—E. W. GIFFORD, Curator, University of California.

JOHN HOPSON, R.A.O.U.

It is often a "blind" pen which writes of the dead, since we would rather praise a likeable man for his virtues than contemplate his failings. But a tribute may be sincere and a faithful portrait because there are no ugly warts of character on the face that has become a memory. So, John Hopson, of Eccleston, New South Wales, has left friends who will ever hold in honour the name of the former naturalist. He will be remembered, probably, long after many scientific men, of some note now, are forgotten.

John Hopson was a nature-lover, a keen observer, and a master of bush-craft. He helped many naturalists, welcomed them to his home, and accompanied them to Barrington Tops. Lacking his guidance, few of us, if any, would have gleaned more than a few grains of knowledge in that "Land of Mist." Our friend, unlike some men of science, who smile at the field naturalist, had a large mind, and a heart to match. He was a hater of meanness, a lover of truth and generosity. Those of us who knew John Hopson, the rare and beautiful nature of the man, when he died, felt that Australia had lost one of her noblest sons—a hackneyed tribute, truly, but noble is the word that must be linked with the name of the Eccleston naturalist. He loved all living things, and knew the ways of birds on the Barrington Plateau, and in his home river valley.—C.B.

F. G. LAWRENCE.

Mr. Frederick George Lawrence, R.A.O.U., of Fremantle, Western Australia, died suddenly on June 8 last, after a period of ill-health. He was 61 years of age at the time of his death, having joined the R.A.O.U. in 1920, and had been a member of the old Natural History and Science Society (now the Royal Society), and the Western Australian Naturalists' Club. Of a quiet and retiring disposition, he rarely came in contact with his brother naturalists, but took a keen interest in various branches of science. Besides ornithology, he was interested in microscopy, and had prepared a number of slides of local foraminifera. Other interests included photography, chess and bowls. Mr. Lawrence, who was a bachelor, was born in London, coming to Western Australia at the end of 1897. He joined the firm of Lionel Samson and Son immediately on his arrival, and attained the position of accountant to the company in 1902. He was deeply respected by the business community with which he came in contact.

News and Notes

Nature-Study Expedition.—The fifth of the Nature-Study Expeditions organised by Mr. E. F. Pollock, F.R.G.S., of the Royal Zoological Society of New South Wales, and the Royal Australasian Ornithologists' Union, has been timed to take place immediately after Christmas, and during the summer educational vacation. The locality chosen is the Kuring-gai Chase National Park, Broken Bay, and the Hawkesbury River. An ideal situation in the park, fronting a beach opening on to Broken Bay, has been selected for the camp-out. Some of the grandest scenery in Australia is within easy reach, and all the many accessible beauty spots will be visited during the four weeks the expedition will be operating. The camp will be on similar lines to those conducted in recent years by Mr. Pollock to the Great Barrier reef area and Lord Howe Island. Scientists from other States have notified their intention to participate. Ladies and gentlemen interested in Nature Study—Zoology, Ornithology, Botany, etc.—should communicate at once with Mr. Pollock, at his address, Carrington-avenue, Strathfield, if they desire to take part in the expedition. Members of the R.A.O.U. are specially invited to participate.

WANTED.

The Emu, Volume 1, complete with title page and index.—Angus & Robertson Ltd., 89 Castlereagh-street, Sydney.

Correspondence

No. 12 Fullarton Road, Mitcham, S.A.,
10th July, 1928.

The Editor, *The Emu.*

Sir,—Referring to our Article on the Kangaroo Island Emu (*The Emu,* Volume XXVIII., part 1), we wish to state that the inverted commas should be placed after the word Museum on the 4th line of page 5, and not after the word Ostrich on the 6th line. The fact that the wings were copied from those of an Ostrich is our observation, and apparently had not previously been noticed.—Yours, etc.,

A. M. MORGAN.
J. SUTTON.

Meetings of Council of R.A.O.U.

The July meeting was held on Tuesday, the 10th, Dr. Leach occupying the chair. Arrangements for the holding of Congress at Canberra were discussed. Correspondence was received expressing satisfaction that the Federal Capital had been chosen, and supplying information which will help materially to make the function a success.

Capt. E. V. Sanderson, of New Zealand, wrote, resigning from the Union, because of the prominence given to collecting. The Council is composed of members of all shades of opinion, and it is claimed that collecting is not unduly favoured. It is felt that, with a more tolerant attitude on both sides, collectors and non-collectors can work together amicably for the betterment of the Union. Capt. Sanderson was asked to reconsider his resignation.

Mr. Bryant was appointed Assistant Editor.

At the August meeting, on the 14th, Mr. Ross acted as chairman. The Commissioner of Police at Hobart wrote, stating that attention would be given to any raids likely to be made by collectors upon the Ground Parrots *(Pezoporus)* in Tasmania. The Chief Librarian, Melbourne, stated, in reply to a suggestion of the Council, that arrangements had been made for the Librarian to inspect the H. L. White library, with a view to purchase.

The Chief Inspector of Fisheries and Game enquired whether the Council recommended the issue of a permit to collect skins and eggs. It was decided to ask Mr. Arnold for further information as to the work he intended to do.

It was agreed to enter into a very satisfactory arrangement with Mr. Cayley for coloured plates for future issues of *The Emu.*

On September 11th, Dr. Leach occupied the chair. Further arrangements for Congress were considered, and any further action which may become necessary will be taken by a sub-committee. The fullest co-operation and assistance has been offered by the Federal authorities, and details as to the cost of transport and catering will be supplied to members.

The question of recommending the issue of a permit to Mr. Arnold was further discussed, and it was decided, on a majority vote, to recommend the issue of the permit desired.

A general discussion on the business to be submitted to the Congress showed several important matters awaited settlement. It was reported that a good delegation of members was likely to attend the Congress.

Annual Congress

The Annual Congress at Canberra, on November 20, promises to be very successful. A good attendance of members is assured, and those who have not had the privilege of seeing the Federal Capital Territory should hasten to take advantage of this unique opportunity of inspecting Australia's capital at its best.

Matters of importance to the economic welfare of Australia, to the protection of birds, to ornithology in general, and to the Royal Australasian Ornithologists' Union will be discussed.

The Federal Capital Commission, under Sir John Butters, is co-operating with the Union. Fuller details are being forwarded to members with the notice and business paper of the Congress, and the postal votes for the election of office-bearers

Please note, that in order to join the New South Wales members at the camp at Port Stephens, the Congress has been fixed for November 20.

The date of publication was October 1st, 1928.

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